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CLASSIFICATION OF THE GLYCOSURIAS*

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If the mortality statistics of diabetes mellitus be consulted it will be found that the expectation of life for all classes of the disease has been increased by some three and a half years since the introduction of insulin. On analysis it will be seen, however, that this gain is confined entirely to the younger patients, and after the age of 55 the mortality has continued to increase at approximately the same rate as prior to 1922. This surely is a fact of the greatest significance, and while the value of insulin cannot be overestimated, anyone with a considerable experience of the disease can recall a number of cases in which it has failed to produce the results expected of it. This failure is commonly, and often rightly, attributed to the patient's inability to keep strictly to the regime prescribed for him; but in a proportion the blame is unjust and the failure lies elsewhere.

The glycosuria of a man of 80, which has been present for twenty years, and the acute diabetes of a child of 8 may both give the same fasting blood-sugar figures, and both are labelled as diabetes; but clinical experience teaches us that the outlook and the treatment necessary differ entirely in the two cases. In other words, we have not made a sufficient attempt to differentiate the types of glycosuria, and may use our remedy blindly in cases where the primary fault is not a deficiency of the pancreas.

Unfortunately this confusion is increased, as many textbooks of medicine state definitely that diabetes mellitus is due to a deficiency of islet tissue, though physiology has demonstrated that glycosuria may be due to a large variety of causes. Again, statistics show that while the mortality in patients under 14 is due to coma in 100 per cent. of the cases, in patients over 75 no deaths are due to this cause, and in fact the liability to coma decreases continuously as the age advances. So while the young patient dies directly from the disturbance of his metabolism, in the older one the complications are the dominant factor, a fact which alone suggests a wide difference of aetiology.

Carbohydrate Metabolism

The classification of the cases is therefore a matter of supreme importance in deciding both on the prognosis and on the line of treatment to be followed, and it can only be attempted if we bear in mind the physiology of carbohydrate metabolism and differentiate our cases on this basis. Before trying to make such a classification I would recall certain facts in the complicated subject of carbohydrate metabolism.

Three groups of organs appear to be involved. In the first we have the nervous system, the pituitary, the thyroid, and the adrenals, which seem to be concerned with katabolism and the mobilization of carbohydrate from the carbohydrate stores. The production of glycosuria by nervous stimuli has been known for many years, but the fact that it only occurs when the pituitary is intact suggests that its action is an indirect one. Recently an extract of the anterior lobe of the pituitary has been prepared which will produce hyperglycaemia, ketosis, and lipaemia in a normal dog. One school considers that many cases of diabetes mellitus are primarily due to a pituitary overactivity. Again, the thyroid will produce an increased breakdown of liver glycogen, and the blood-sugar curve in hyperthyroidism may closely resemble that of a case of mild diabetes mellitus. Although I am unaware of any case of permanent glycosuria due to an overaction of the adrenals, the action of adrenaline in producing hyperglycaemia is well known, and as it does not occur if the liver has been removed it is almost certainly due to a breakdown of liver glycogen.

In the second group we have the islet tissue, and though fourteen years have elapsed since the discovery of insulin its action is still incompletely understood. It does appear, however, to be concerned with the storage of glucose as glycogen, and it seems that glucose must undergo this process before it can be used by the tissues. Insulin is therefore anabolic, and in some respects antagonistic to the first group.

Thirdly, we have the liver and the muscles, which are the great storehouses of carbohydrate. The latter also are the principal users of sugar, but their share in the production of glycosuria I will leave for the moment, until I am discussing the subject from its clinical aspect.

Possible Causes of Hyperglycaemia

There would appear, then, to be four possible causes of hyperglycaemia:

1. An increased katabolism leading to an increased mobilization of carbohydrate and fat from the storehouses, in which the nervous system, the pituitary, the thyroid, and possibly the adrenals are involved.
2. A diminished capacity to store owing to lack of insulin.
3. A defect in the storehouses themselves—the liver and muscles.
4. An inability of the tissues to use.

Unfortunately the cases are not always clear-cut—two or more organs may be involved or the disturbance of one organ may throw such a strain on another that it, too, gives way. Nevertheless I will attempt on this basis to make a clinical classification of the glycosurias. Before doing so I would draw attention to two factors which

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may modify temporarily the course of the disease, whatever its basic cause may be.

First, rapidity of mobilization may be increased by a stimulus which is often an infection, but which may be purely psychic and may suddenly convert a comparatively mild case into a very grave one. When this happens enormous doses of insulin may prove to be insufficient to reduce the hyperglycaemia until the stimulus has subsided. An alternative explanation of the huge doses required is that the infection interferes directly with the action of insulin; but this has not been proved, and if it really were the case we should expect to find glycosuria in non-diabetic persons whenever they were subjected to a profound toxaemia. Secondly, the functional capacity of the utilizing tissues has to be considered. The muscles differ from any machinery known to us in that they can burn themselves to provide their own fuel. Muscles must have carbohydrate in order to function, and if it is not supplied they will destroy themselves in order to produce it. It would seem unreasonable to expect them, while so engaged, to use fuel to their maximum capacity. This, I believe, is the explanation of the benefit seen in the modern high carbohydrate diet, as it renders this wasteful chemical process unnecessary, and it also explains in many diabetics the improved tolerance, which may continue long after their insulin dose has been apparently stabilized.

These factors—the rapidity of mobilization and the health of the tissues—must be borne in mind in every case that is under treatment, and a careful search should be made for septic foci in teeth and tonsils, and in particular for tuberculosis of the lungs. If insulin is to be regarded as a diagnostic as well as a therapeutic weapon it must be remembered that it will lower the blood sugar, temporarily at any rate, in every one, whether there is any pancreatic deficiency or not; and if the pancreas be normal there will be overstorage, and we will be dealing with a toxicological rather than with a pharmacological effect. This is a point which I cannot emphasize too strongly.

Twenty years ago the state of the urine was regarded as the criterion of successful treatment. Later the recognition of renal glycosuria showed that this might be fallacious, and the blood-sugar level took its place. Taken by itself a fall in the blood-sugar level may be equally fallacious, and it can only be considered beneficial if it be accompanied by an improvement in the patient's general health.

Increased Mobilization

In the first group, due primarily to overproduction, are the comparatively rare cases following acromegaly, in which there is a pituitary overactivity, and in them, as would be expected, the response to insulin is poor. Probably many of the cases associated with hyperthyroidism also belong to this group. It is a not very uncommon combination, and in my experience these cases do badly both with diet and with insulin, and the only successful treatment I have seen has been the prompt removal of the thyroid, although insulin may have to be continued after the operation, as there is often a combination of defects. Thus in a woman aged 55, with a basal metabolic rate of +52 per cent., the urine was loaded with sugar and acetone, and the fasting blood sugar was 0.395 gram per 100 c.cm. despite 50 units of insulin a day. Thyroidectomy was performed, and the urine is now sugar-free and the fasting blood sugar is 0.162 gram per 100 c.cm. on 20 units daily, and the patient is in good health.

In a certain number of cases the primary lesion appears to be in the brain itself. There may be a history of overanxiety for some time prior to the illness, or a family history of nervous instability, and while 70 per cent. of adult diabetics give a history of obesity these patients may have been thin always. I invariably suspect overmobilization if such a history is obtained. I will quote two cases in illustration of this.

Case I

A girl, aged 18, had a history of meningitis (cause unknown) in infancy. Two brothers had died of meningitis and another brother later committed suicide. Sugar was discovered in her urine prior to an operation for chronic appendicitis. She was dieted and underwent the operation successfully. For the next two years she remained in good health, but it became more and more difficult to keep the blood sugar at the normal level and the urine free from sugar. When insulin was introduced into this country it was therefore decided to try it. For a time she became sugar-free, but her health did not improve; she became obese, and in spite of the fact that she had several alarming reactions after exercise it became impossible to keep her free from sugar, and a further increase of the dose of insulin made her ill. For a time she was in the London Hospital, under the care of Dr. Otto Leyton, to whom I am indebted for further information. It was found that when given a dose of 50 units of insulin just before a meal containing only 5 grams of carbohydrate the blood sugar fell very slowly from 0.25 to 0.167 gram per 100 c.cm. in eight and a half hours. Without insulin the fasting blood sugar varied from 0.26 to 0.16 gram per 100 c.cm. Dr. Leyton agreed that she was resistant to insulin, and its use was discontinued. Although insulin produced no clinical improvement it did produce two effects—hypoglycaemic attacks and obesity.

The hypoglycaemic attacks, which always occurred after exercise, showed that the muscles were capable of utilizing sugar, but insulin had interfered with the supply, and the obesity was apparently the result of overstorage. After insulin had been discontinued her health improved, and she continued to live a normal life on a moderate dietetic restriction and without insulin, until she dislocated a cartilage in the knee. She said this made life unbearable. In view of the previous successful appendicectomy the risk of another operation was not considered to be an undue one, and it was accordingly performed. Acetone appeared in the urine in large amounts two days later, and in spite of the administration of 600 units of insulin, which had no effect whatever on the blood sugar, a fatal coma developed a week later. Unfortunately the brain and pituitary could not be examined, but Dr. Susman, who examined sections of the pancreas, and who at that time knew nothing of the history of the case, found that the islet cells were few in number, were largely made up of alpha cells, and a few showed degeneration. He reported that "the features as a whole suggest that the pancreas and islet function have been interfered with through paralysis of the nerve supplying the pancreas, the histological findings closely resembling those described by Opie as due to paralysis."

Here, although there was a deficiency of islet tissue, the case was definitely resistant to insulin, and there was no defect of utilization. I can only explain it as one in which the primary lesion was due to disturbance of mobilization arising from meningitis in childhood, mobilization being so stimulated by operation that a profound ketosis developed, terminating in coma. Another point in this case, which I think should be emphasized, is that for a time insulin brought the blood sugar to normal, but as a result made her fat and ill.

Case II

Another case, a male aged 53, developed diabetes after a prolonged period of overwork. He complained of palpitation, nervousness, and tremulousness, but the basal metabolic rate was not increased and an *x*-ray of the pituitary fossa was normal. He responded poorly to insulin. The fasting blood sugar varied from 0.26 to 0.365 gram per 100 c.cm., even

when he was given 50 units a day, and he complained that he felt ill with it. It was eventually reduced to 24 units daily, with which the blood sugar remained at 0.24 to 0.29 gram per 100 c.cm., and he felt better.

I saw him later in deep coma; the blood sugar gradually rose from 0.38 to 0.95 gram per 100 c.cm.; coma persisted in spite of 260 units of insulin, and he died in twenty-four hours. A necropsy was done, which showed that the thyroid contained an adenoma undergoing toxic changes. The brain showed scattered areas of recent softening and the islet tissue of the pancreas varying degrees of hyaline degeneration up to complete destruction.

In this case there were probably multiple causes giving rise to the disease, and I would regard it as one in which both the nervous system and the thyroid combined to produce over-mobilization, throwing an ever-increasing strain on the islet tissue. I had considered the advisability of thyroidectomy, and now regret that the normal basal metabolic rate dissuaded me from calling in a surgeon. Occasionally a gross organic lesion of the brain may be responsible for glycosuria. I have twice seen cases of encephalitis lethargica in which the glycosuria was at first the predominant feature, and on one occasion a diabetes of long standing appeared to be associated with a temporo-sphenoidal tumour.

The nervous element is therefore a very real one, and it explains the rapid deterioration in diabetics who have been subjected to nervous strain. Probably the beneficial effects from opium and codeine seen in the former treatment of diabetes were due to their inhibition of a nervous mobilization.

Diminished Storage Capacity

A diminished capacity to store owing to lack of insulin is undoubtedly the commonest cause of diabetes, and is found especially in the diabetes of children and young adults. Here the age of the patient alters the clinical appearances. In the young patient growth dominates the picture, the ductless glands, especially the pituitary, are in full activity, mobilization is rapid, acetone as well as sugar appears in the urine early in the case, and there is no history of obesity. Usually the response to insulin is good, but owing to the rapidity of mobilization stabilization may be difficult and the patient will pass from hyperglycaemia to hypoglycaemia in a few hours. In older patients, where growth has ceased and especially where sexual maturity has been passed, the disease is not so rapid. Acetone appears later, and there is often a history of a rapid increase of obesity for one or two years prior to the onset of the disease, followed by an equally rapid fall.

It would seem that there has been time for a compensatory mechanism to function, and the increased carbohydrate has been stored as fat. This history I regard as almost pathognomonic of a pancreatic type of diabetes, and the case almost invariably responds to insulin. The appearance of these pancreatic patients also is often characteristic, and the brick-coloured cheeks on a yellow-tinged background are in themselves a clear call for the immediate use of insulin. It is the pancreatic type of diabetes, too, in which acetonuria is so common, and the great danger is from a direct disturbance of metabolism ending in coma. On the other hand, complications such as cataract, true carbuncle, and gangrene are comparatively rare. Even if the disease occurs later in life and there are repeated attacks of coma the patient usually escapes them.

Liver Disturbance

Many varieties of liver disturbance appear to be responsible for a glycosuria. Haemochromatosis is one of the more obvious and by no means rare causes. It occurs only in men, and a bronzed tinge of the skin combined with an enlarged liver is always suspicious. Here liver, pancreas, and muscles are all involved, so that it is difficult to assess the responsibility of one particular organ, but the poor response to insulin is evidence that factors other than the pancreas are concerned. In one case an enlarged hard liver had been noted seven years before the onset of glycosuria, which suggested that a hepatic disturbance was the primary condition.

Glycosuria, too, is commonly associated with a cholecystitis. Usually it is mild in type and responds to diet alone, and often it clears up completely after the gall-bladder has been removed. Although the appearance of sugar is usually attributed to an associated pancreatitis insulin is rarely either necessary or advisable, and it has been pointed out that, while in pancreatitis the head of the organ is chiefly involved, the bulk of the islet tissue is in the tail.

The glycosuria of extreme obesity, often found in beer drinkers, is probably entirely hepatic. It responds well to diet, and I believe is wholly due to an excessive deposit of fat in the liver.

The glycosuria of gout is also probably associated with the liver disturbance. It is usually of mild type, and in my experience does not respond to insulin. Thus a man who is now 60 has been under my observation for the past ten years; he is liable to occasional attacks of gout and has had sugar intermittently for twenty years. The family history is remarkable: six out of eight brothers and sisters have glycosuria, but all have reached the age of 60 or over. He did not respond well to insulin, and with 40 units a day did not become sugar-free and there was no clinical improvement. For a time he took 8 units daily, but the blood sugar was high (a fasting level of 0.312 gram per 100 c.cm.). For the last six months, however, he has taken no insulin at all, and the fasting blood sugar has dropped to 0.231 gram per 100 c.cm., and he says he feels better without it.

Acute liver disease associated with diabetes is very rare, but recently I saw a case in which it appeared to be undoubted. A man aged 40, who had passed as a first-class life for insurance two years before, developed a severe lobar pneumonia. Two days later jaundice appeared and sugar was found in the urine. When I saw him in consultation he was intensely jaundiced, the liver was palpable, and the blood sugar 0.336 gram per 100 c.cm. As we thought the case was hepatic rather than pancreatic he was given glucose and only a moderate dose of insulin, 10 units twice a day. The pneumonia cleared up by lysis and the temperature was normal six days later, the jaundice also disappeared, the urine became sugar-free, and the insulin was then stopped. The last blood sugar was 0.129 gram per 100 c.cm. one and a quarter hours after a mixed meal, and he was then taking an ordinary diet and apparently in perfect health.

Diabetes and Pernicious Anaemia

The association of diabetes mellitus with pernicious anaemia is a well-recognized although not very common condition. Here we seem to be on surer ground, for in pernicious anaemia we have a disease which is definitely cured by liver therapy, and when this has been achieved the diabetes mellitus may clear up completely. It is important to bear the association in mind or serious consequences may ensue.

Thus in March, 1935, I was asked to see a woman of 40 who had been taking 15 units of insulin twice a day for the past six months. She was very ill, and although sugar-free she was convinced that the insulin

made her feel worse. There was a considerable anaemia, and as it was associated with numerous retinal haemorrhages (a very rare condition in uncomplicated diabetes under middle age) I had a blood count done. This showed a typical pernicious anaemia. Insulin was stopped and liver treatment substituted, and she is now able to take a diet containing 8 oz. of bread without any insulin at all, and she has since remained in good health.

A still more remarkable case was admitted to the Infirmary in June, 1936. A woman of 56 was on the verge of coma; the urine was loaded with sugar and acetone and the blood sugar was 0.336 gram per 100 c.cm. A blood count showed 1,830,000 red cells, 44 per cent. of haemoglobin, and a colour index of 1.22. There was also auricular fibrillation. Owing to the proximity of coma it was felt to be unjustifiable to withhold insulin altogether, and she was given two doses of 15 units on the day of admission and liver injections were started immediately. No more insulin was given, and the red cell count dropped to 980,000 during the next three days, but after that a rapid improvement set in and two months later the count was 4,018,000, with 78 per cent. of haemoglobin, and on an ordinary diet without insulin the fasting blood sugar was 0.19 gram per 100 c.cm.

Effects of Arteriosclerosis

Perhaps the most difficult group is that in which arteriosclerosis is the predominant feature. Here the glycosuria is often mild—apart from an infection there is no acetonuria—the diabetic symptoms are not severe, and there may be no loss of weight. Often, indeed, sugar is discovered accidentally when the patient comes under treatment for some condition such as gangrene, carbuncle, cataract, or a coronary thrombosis. It may be that the glycosuria clears up spontaneously for a time, and every surgeon is familiar with cases of carbuncle and gangrene in which the sugar disappears after the infection has been dealt with. In some of these patients a considerable improvement follows the administration of insulin, and in them the usual explanation that we are dealing with an arteriosclerosis of the pancreas is probably correct. In others, however, only a partial improvement or no improvement occurs, and a defect in some factor other than the pancreas may be responsible. What this factor is I am unable to say; possibly it is an insulin kinase as postulated by Himsworth; but I believe that here the primary condition is not an inability to store glucose and make it usable, but an inability of the tissues to use the sugar.

I have already mentioned the question of efficient utilization and I will now return to it in more detail, as its importance is often overlooked. Diabetics are liable to attacks of hypoglycaemia when taking insulin. Now hypoglycaemia may be due to one of three causes:

(i) A deficient mobilization of carbohydrate such as occurs in von Gierke's disease;
(ii) Overstorage; or
(iii) Over-utilization.

In young diabetics these hypoglycaemic attacks are most likely to occur after exercise—that is, although the capacity to store is deficient, utilization is unimpaired. In the arteriosclerotic group exercise is an uncommon cause of hypoglycaemia. Hypoglycaemia does occur, but it is of a different type; it may come on at any time, possibly during the night, and does not seem to follow any particular exertion. Often excess of insulin is shown not by any definite attack but by a feeling of vague ill-health, periodic headaches, or an increasing obesity. Priscilla White has shown that even young diabetics may develop arteriosclerosis if given too much fat, and clinically we find that a young patient who in the early stages of treatment was very liable to hypoglycaemic attacks after exertion gradually becomes free from them. Here the most probable explanation is that a developing arteriosclerosis adds an impaired utilization to the clinical picture.

At the same time the renal threshold tends to rise, and the patient will often tell you that he only feels well when the blood sugar is considerably above the figure of 0.1 gram per 100 c.cm. This heightening of the renal threshold is commonly found in arteriosclerotic diabetics, and I regard it as not due to any deficiency of the kidneys but rather to a conservative process. It is necessary for these people that the blood sugar should be considerably above the normal level in order that they may overcome a deficient utilization. Indeed I have seen an arteriosclerotic diabetic who was in insulin coma, although the blood sugar was exactly 0.1 gram per 100 c.cm. Later I again examined the blood when he was feeling well, and although sugar-free the fasting level was then 0.225 gram per 100 c.cm.

The optimum level for a particular person, therefore, may be very much above the so-called normal level, and the distinction between the two is of great practical importance. Arteriosclerosis is a gradual process which may take many years to develop, and, like diabetes, it may be strongly hereditary. When examining cases inquiry should be made not only about a history of glycosuria in other members of the family, but whether there has been any liability to the arteriosclerotic forms of heart disease, cerebral haemorrhage, or gangrene. There is often a history of obesity in these cases, usually of long standing, but when the symptoms of diabetes develop the loss of weight may be trivial. There is no history of a rapid increase followed by a rapid decrease of weight, such as I have described in the pancreatic cases, and despite the obesity acetonuria does not arise except in the presence of an infection. In some of the cases there appears to be an associated pancreatic defect, and insulin may be required either permanently or temporarily, but in others it either has no effect or it makes them definitely ill.

We can only find out what its action will be by a cautious trial, relying not on the blood sugar, the optimum level of which we cannot know for each particular patient, but on the clinical findings. I will quote two instances to illustrate the type of case to which I am referring. The first is so mild that it cannot be called a true diabetes.

A female, aged 25, complained of boils, and a little sugar was found in the urine. This disappeared after infection had ceased, and a blood-sugar curve taken then was normal. There were no symptoms of diabetes, the general health was good, and there was no obesity. Her father had had diabetes and gangrene of both legs, and a sister, aged 45, weighed 18 st. and had had glycosuria for many years.

My interpretation of this case is that she is a potential arteriosclerotic with a defective utilization. The boils led to a stimulus of mobilization and sugar appeared temporarily, but a normal blood-sugar curve showed that storage was normal. In the course of time she will become an arteriosclerotic diabetic like the rest of her family. A second case was more advanced.

A woman, aged 46, complained first about her eyesight, and incipient cataract was found in both eyes. There were no symptoms of diabetes. She felt well, and had no loss of weight; the blood pressure was 180/86 mm. Hg, and the urine contained sugar but no acetone and no albumin. The blood sugar was 0.203 gram per 100 c.cm. Her father had had diabetes with cataract, and died of arteriosclerosis and heart failure. She was given a diet of 2,400 calories and 20 units

of insulin twice daily. The blood sugar fell to 0.162 and then to 0.081 gram per 100 c.cm.; later it returned to 0.25 gram per 100 c.cm., and remained about this figure for six weeks. With insulin discontinued but the diet kept the same the blood sugar seven days later was 0.286 and fourteen days later 0.304 gram per 100 c.cm. Two months later the fasting blood sugar was 0.19 gram per 100 c.cm.

This patient later went to India, and the last I heard of her was a rather indignant letter from her doctor asking why insulin had been discontinued, and by the next mail an urgent message from her husband asking for instructions, as a determined attempt to get her sugar-free was making her very ill.

In this case, as in many others, insulin did produce a temporary reduction of blood sugar, but this was followed later by a rise to a higher level than before she came under treatment. Evidently the effect of insulin had been to increase storage for a time until the warehouses had reached the limit of their capacity, when the blood sugar returned to its old level.

Other Considerations

I could quote many such instances in which arteriosclerosis, retinitis, or cataract has often been the principal feature, and bearing in mind the success of liver therapy in the cases associated with pernicious anaemia I have used it on them too, and believe I have seen a clinical improvement, although I have not been able to demonstrate any marked fall in the blood-sugar level. Before leaving this matter I would refer to the subject of arteriosclerotic heart disease, and particularly to coronary thrombosis. Here a moderate glycosuria is common, and lowering of the blood sugar either by carbohydrate starvation or by insulin undoubtedly aggravates the disease. Any reduction of the blood-sugar level to the region of 0.1 gram per 100 c.cm. gives rise to symptoms of vague ill-health, and the optimum figure may be two or three times the normal. It is in these cases particularly that insulin must be used with great caution, and if we blindly try to achieve a laboratory ideal there is a grave risk of sudden death. Race, too, has an important bearing, and the arteriosclerotic type is often seen in Jews.

Diabetes mellitus often appears in the Jewish race, but the cases are nearly always past middle life, and the acute pancreatic type with acetonuria is very uncommon. Usually the disease itself is mild, and they first come under observation for cataract, retinitis, or hyperpiesis rather than for glycosuria. The response to insulin is variable, and so a cautious prognosis should be given. Even when diabetes does occur in the young Jew its clinical picture and response to insulin differ from those of the young Gentile, in whom a dramatic onset and a dramatic response to treatment is the rule, so that we can only conclude that the aetiology is entirely different.

The following case will illustrate my meaning.

A girl of 12 first consulted her doctor complaining of blueness and coldness of the legs, and glycosuria was discovered in the course of routine examination. Apart from a little thirst there were none of the usual symptoms of diabetes; there was no loss of weight and her general health was good. The family history was suggestive. The mother had had a mild diabetes for many years and an aunt and cousin suffered from Raynaud's disease. The fasting blood sugar was 0.285 gram per 100 c.cm., and with 5 units of insulin twice a day it fell to 0.128 but gradually rose again, and later was 0.346 gram per 100 c.cm. on 15 units twice a day. There has never been any acetone, nor has the child had any of the hypoglycaemic attacks which so commonly affect non-Jewish children. When I saw her a few days ago she had stopped the insulin of her own accord. The fasting blood sugar was 0.212 gram per 100 c.cm., and she said she felt better without it.

Here the presence of Raynaud's disease in both the patient and her aunt and the poor response to insulin strongly suggest a peripheral rather than a pancreatic cause.

Conclusion

The classification I have suggested is unorthodox and will have to be modified considerably as time goes on, for it is certain that other factors, the sex organs in particular, enter into the production of glycosuria. At present, however, our knowledge of them is so meagre that they cannot yet be considered.

Some of my conclusions, however, I do not think will have to be modified.

First.—That glycosuria is a symptom and not an entity, and each particular case must be studied to find the primary disturbance.

Secondly.—The optimum blood-sugar level may not coincide with the so-called normal blood-sugar level.

Thirdly.—The criterion of successful treatment is not the achievement of a laboratory ideal, the rationale of which we do not fully understand, but whether the patient does or does not show a clinical improvement.

DIRECT BRONCHOSCOPIC INVESTIGATION IN HAEMOPTYSIS WITHOUT PHYSICAL OR RADIOLOGICAL MANIFESTATIONS

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(WITH SPECIAL PLATE)

Etymologically haemoptysis denotes "spitting of blood," but the term has become by general usage commonly restricted to the expectoration of blood originating from that portion of the respiratory tract situated below the vocal cords. In certain cases of haemoptysis there is not infrequently a lack of signs on complete clinical examination and direct or contrast radiological study, so that it is impossible by these means to ascertain the cause or source of the bleeding. It is to such cases that the following notes refer.

The significance of haemoptysis as a sign of serious pulmonary disease has been long recognized, and it is impossible and unnecessary in this short article to enumerate in detail the many causes of this accident. It is a matter of experience, however, that in a large proportion of cases haemoptysis is caused by pulmonary tuberculosis, and it is not surprising, therefore, to note in the older literature the great significance accorded to blood-spitting in the diagnosis of this disease. Commonly the majority of patients who spat blood were regarded as cases of pulmonary tuberculosis, and many correctly so diagnosed succumbed to the disease: the remainder either died as the result of an unrecognized causative lesion or lived an invidious existence under the stigma of "consumption."

It is of interest to note that Vinson (1928) compared the frequency of the incidence of haemoptysis in one hundred unselected cases of pulmonary tuberculosis, of mitral stenosis, and of chronic bronchiectasis, and he found that this was greatest in the last-mentioned disease. From his observations he concluded that pulmonary tuberculosis was regarded as the usual cause of haemoptysis merely because of the frequent and widespread prevalence of the infection, whereas the actual relative incidence of haemorrhage was greater in other less commonly recognized pulmonary lesions. Würtzen (1936) also recorded that of 5,264 admissions into a sanatorium between January, 1929, and August, 1935, 869 cases were admitted on account of haemoptysis, and it was found that only 582 of these 869 patients were suffering from pulmonary tuberculosis. Thus in approximately one out of every three cases the cause of the haemoptysis had been misinterpreted, and the actual causative lesions found in these 287 incorrectly diagnosed cases were pneumonia in fifty cases, new growth in twenty, cardiac disease in sixty, and epistaxis in fifty-eight.

The development of *x*-ray examination of the chest was the first great advance in the positive differential diagnosis of pulmonary pathology, and the value of this has been enhanced within the past ten years by the use of contrast material within the bronchi (lipiodol, etc.) and the perfection of the technique of bronchography. Following the introduction of radiological examination of the chest it was found that in many cases of haemoptysis there was no demonstrable pulmonary lesion, and in such cases it was assumed that the source of the haemorrhage was a tuberculous focus near the hilum. This assumption prevailed until further assistance in diagnosis was rendered by bronchoscopy, and to-day the bronchoscope is very slowly being recognized as an instrument of precision for the diagnosis and treatment of bronchial and pulmonary lesions, and not merely as a mechanical means for the extraction of foreign bodies from the bronchial tree. In 2 per cent. only of the patients treated at Chevalier Jackson's clinic (1934a) was bronchoscopy performed for such accidents, notwithstanding an enormous increase in the number of foreign body cases. In *The Eye, Ear, Nose, and Throat* (Practical Medicine Series, 1931, p. 570) it is stated that "the history of the progress in the more accurate understanding of diseases of the chest runs *pari passu* with the more widespread use of bronchoscopy," and its immense value in this respect has been aptly compared with the value of the cystoscope in genito-urinary disease.

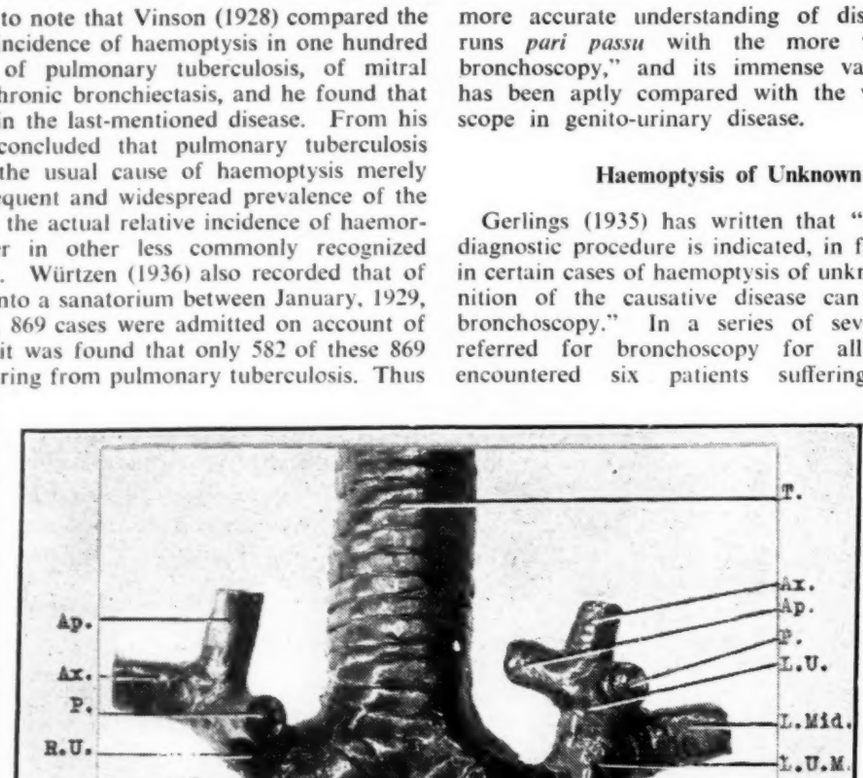

FIG. A.—T., Trachea Ap., Apical bronchus. Ax., Axillary bronchus. P., Pectoral bronchus. R. and L.M., Right and left main bronchi. R. and L. Mid, Right and left middle lobe bronchi. R. and L.L., Right and left lower bronchi. Ax. B., Axillary basic bronchus. P.B., Posterior basic bronchus. Ant. B., Anterior basic bronchus. C., Cardiac bronchus. D., Dorsal bronchus. R. and L.U., Right and left upper lobe bronchi. L.U.M., Left upper and middle common stem bronchus.

Haemoptysis of Unknown Origin

Gerlings (1935) has written that "bronchoscopy as a diagnostic procedure is indicated, in fact is indispensable, in certain cases of haemoptysis of unknown origin. Recognition of the causative disease can only be made by bronchoscopy." In a series of several hundred cases referred for bronchoscopy for all causes we have encountered six patients suffering from recurrent haemoptysis who exhibited no physical or radiological signs of pulmonary disease. In these six cases the causative lesion was found by bronchoscopic examination to be one of the following: tracheal varix, chronic non-specific granuloma, simple new growth, or malignant neoplasm.

The nomenclature used in the following case histories to indicate the situation of the lesions is based on the description of the bronchi given by Nelson (1934), and a semi-diagrammatic picture of the main bronchi and their branches is shown in Fig. A.

Tracheal Varix

Haemoptysis without physical or radiological signs occurred in one patient of the present series, and the source of the bleeding was found by bronchoscopy to be a varix of the tracheal wall.

Case I.—A male, aged 60, complained of recurrent haemoptyses for five months, and while under observation he coughed up bright red aerated blood on more than one occasion. Clinical examination and repeated direct and contrast radiological examination did not reveal any manifest abnormality in the chest. The patient was known to have a chronic juxtapyloric peptic ulcer, which was shown by *x* rays. The sputum was negative for tubercle bacilli, and the blood Wassermann reaction was negative.

Bronchoscopy showed a varicosity about 1½ cm. in length by 1 cm. in breadth on the left antero-lateral wall of the trachea immediately above the bifurcation (Fig. 1, Special Plate). This area bled during examination, and was the

obvious source of the haemoptysis, as the remainder of the visible bronchial tree appeared to be normal.

In an article published since these notes were written Gerlings (1936) has described three cases of tracheal and bronchial "venectasies," and he has recorded a comprehensive list of references to this condition, most of which are Continental. His conclusions are that the only clinical sign of the lesion is sudden profuse haemoptysis accompanied by coughing, which occurs independently of exertion and which is prone to recur, though the amount of blood lost is not usually dangerous to life. It would appear from his observations that the condition occurs most often in people of middle age, that the site of predilection of the varicosity is on the anterior tracheal wall just below the vocal cord, although it may be situated anywhere in the trachea or bronchi, and that it may vary in character from a diffuse mucosal hyperaemia to a definite varix.

Chronic Non-specific Granuloma

There was one case of haemoptysis due to a chronic inflammatory lesion in the present series.

Case II.—A female, aged 56, complained of a slight dry cough for some months. During the five weeks preceding examination she had coughed up blood on four occasions, and at the last attack she had spat up a large quantity—at least two kidney-dishes full—of bright red blood. There were no physical signs of pulmonary disease, and repeated direct *x*-ray examinations disclosed "no *x*-ray evidence of bronchial carcinoma" or any other radiological abnormality. *X*-ray after the instillation of lipiodol showed a normal bronchogram. The blood Wassermann reaction was negative, and the sputum was negative for tubercle bacilli.

Bronchoscopic examination revealed a half-ring of granulation tissue on the lateral wall of the right main bronchus immediately below its junction with the upper lobe bronchus (Fig. 2, Special Plate). This was not causing any bronchial obstruction, and it was thought to be a chronic inflammatory manifestation. No treatment was instituted, and the patient had no further haemoptysis. Three months later she was readmitted for further bronchoscopic examination in order to confirm the diagnosis of non-malignancy. A proprietary local anaesthetic was used instead of the usual 2½ per cent. cocaine with adrenaline, and during the administration the patient collapsed and died before any bronchoscopic examination was undertaken. Apparently she had an idiosyncrasy to the particular drug used.

The aetiology of this inflammatory lesion was undetermined, but that it resolved spontaneously became obvious, as Professor Dible, who performed a necropsy, found no abnormality of the bronchi.

Non-specific granulomata of the tracheo-bronchial tree have been fully discussed by the Jacksons (1932), who have described several cases, and they state that, although the aetiology is undetermined in most of them, there is evidence of inflammation as a secondary, if not primary, factor. The granulomatous masses may be either sessile or pedunculated, although the former predominate; they vary in size from that of a granule to that of a large pedunculated tumour, and the tissue occasionally is present at more than one site in the bronchi. Although ulceration does occur this is relatively rare in comparison with true neoplasms, which they resemble in appearance, but the fixity and rigidity of the bronchial wall observed bronchoscopically in the neighbourhood of carcinomatous growths is absent with simple granulomata. These observers state that the early signs of simple granuloma of the bronchi are haemoptysis and a wheeze heard at the open mouth, and they are of the opinion that a correct diagnosis can be made only by bronchoscopy.

Innocent New Growths

One patient of the present series who had an innocent neoplasm of the bronchus complained of long-standing recurrent haemoptyses; and, in spite of repeated investigations in various hospitals and sanatoria, only once were any physical or radiological signs of a pulmonary lesion detected.

Case III.—A male, aged 22, complained of a cough which had been present for nine years, and of recurrent haemoptyses over a period of six years. Physical and radiological signs of pulmonary disease were absent except immediately after one attack of bleeding, when there was shown radiologically a transient collapse of the left lower lobe secondary to occlusion of the bronchus by blood. The radiological findings are of interest, and are given in detail.

January 2, 1932: "Normal."

August 26, 1932: "Normal."

June 12, 1933: "Partial collapse of left lung, falling in of left side of chest, mediastinum displaced. Indefinite shadow at left root, ? tumour pressing on bronchus. These changes have taken place since previous *x*-ray ten months ago."

June 23, 1933: "Condition has apparently improved—the heart and mediastinum are not so displaced as at the previous *x*-ray."

September 1, 1933: "Normal."

December 16, 1933: "Normal."

December 17, 1935: Lipiodol bronchography—"No abnormality shown."

The sputum was negative for tubercle bacilli, and the blood Wassermann reaction was negative.

December 22, 1935: Bronchoscopy disclosed a sessile tumour of the anterior wall of the left lower bronchus immediately above its terminal divisions (Fig. 3, Special Plate). The tumour was of very hard consistency, and a specimen removed was reported by Dr. R. Mole to be a "fibroma arising from bronchus." Eight 1.5 millicurie radon seeds were inserted into the growth.

There was no further haemorrhage for seven months, when the patient had a profuse haemoptysis. A further bronchoscopic examination showed the tumour to be reduced to about half its original size. The remaining mass was treated by diathermy.

Chevalier Jackson (1934b) has written of benign tumours that all the common types seen elsewhere may occur in the trachea and bronchi, and that their early symptoms may be so slight as to escape notice. Two symptoms, however, are almost always present—namely, wheezing heard at the open mouth and haemoptysis. Morlock and Pinchin (1935) have reported nine cases of simple new growth in a series of 150 cases of bronchial neoplasm—that is, in 6 per cent. of their cases. From their observations adenoma would appear to be the most common simple new growth, followed closely in frequency by fibroma, and Gerlings (1936) has reported thirty-four cases of adenoma out of fifty-one cases of innocent bronchial new growths. Morlock and Pinchin (1935) emphasize the fact that the first symptom of such growths is frequently haemoptysis, which may recur. They agree with the findings of Wessler and Rabin (1932), who have stated that the haemoptysis is of a definite characteristic type—for example, sudden onset unaccompanied by other symptoms of pulmonary or bronchial disease, abrupt cessation, and absence of subsequent staining of the sputum. In one of the cases reported haemoptysis had been the only symptom for twenty years.

In these cases of non-malignant new growths bronchoscopy would appear to be the only means of diagnosis, and in a review of the cases published up to a few years ago it was stated that "careful search of the literature reveals that as the only cases of benign neoplasm of the bronchus diagnosed, except post mortem, were diagnosed

bronchoscopically, one is obliged to concede that the only means of making a definite diagnosis of benign neoplasms in the bronchus in a living patient is by bronchoscopy."

Malignant Neoplasms

Malignant neoplasms of the bronchi are common, their manifestations are legion, and their symptoms may appear in manifold guises—asthma, tuberculosis, unresolved pneumonia, lung abscess, bronchiectasis, etc., may all be simulated. It is now recognized that carcinomata arise primarily in the bronchi either from the mucosa or from the deeper glands in the submucosa, and Kramer and Som (1936) have concluded from an analysis of a large series of cases that 62 per cent. of these growths occur in the larger bronchi, 15 to 20 per cent. in the small branch bronchi, and that parenchymal carcinoma is very rare. It is the experience of the writers of this article that the majority of bronchial carcinomata arise within the first half-inch of the main bronchi below the tracheal bifurcation. A large number of growths are therefore within easy access of the bronchoscope, and Jackson (1934c) has written that the "bronchoscope affords the only means of making an early and positive diagnosis of malignant disease of the bronchi and lungs," and that "a cancer no larger than a grain of wheat can be found in the bronchus and removed for histologic examination if only the opportunity for bronchoscopy is afforded."

Haemoptysis is a common symptom in cases of malignant neoplasm of the bronchi. Farrell (1936) analysed the clinical signs in a series of fifty cases of bronchial carcinoma, and he found that haemoptysis was present in 48 per cent. of cases, though not necessarily as an early symptom. Ormerod (1933) is of the opinion that in the early stages the sputum is merely blood-streaked, and as the disease advances the haemoptysis ceases, to reappear in the later stages as profuse haemorrhages.

Three cases of carcinoma of the bronchus are described below in which haemoptysis was the only sign present. All of the cases had been fully investigated clinically and radiologically, and they bear out Hudson's (1933) contention that bronchial neoplasms can be recognized endoscopically before they can be detected by *x*-ray examination.

Case IV.—A female, aged 37, complained of recurrent "haemorrhages from the chest with after-weakness" of two years' duration. Physical signs were absent, and repeated direct *x*-ray examinations and lipiodol bronchography were negative. The sputum was negative for tubercle bacilli, and the blood Wassermann reaction was negative. Bronchoscopy revealed a small haemorrhagic fungating area at the junction of the right middle and lower lobe bronchi (Fig. 4, Special Plate). It was impossible to remove a piece of tissue for examination, but clinically there was no doubt as to the nature of the lesion.

Case V.—A male, aged 49, complained of pain in the left chest, morning cough, slight dyspnoea, and recurrent haemoptyses of nine months' duration. Routine clinical examination did not reveal any evidence of organic disease. Repeated direct *x*-ray examinations and lipiodol bronchography were negative. Fig. 7 (Special Plate) shows the normal bronchogram of this patient. His sputum was negative for tubercle bacilli, and the blood Wassermann reaction was negative.

Bronchoscopy showed an early carcinoma affecting the anterior wall of the left lower bronchus immediately above its division into its terminal branches (Fig. 5, Special Plate). The biopsy report was "bronchial carcinoma." Ten 1.5 millicurie radon seeds were inserted into the growth.

This patient was examined three months later by the bronchoscope, and the tumour had then entirely disappeared; there remained only some congestion of the bronchial mucosa over the situation at which the radon seeds had been implanted. A Tudor Edwards radon-carrying tube was inserted into the lumen of the bronchus for a week subsequently.

Case VI.—A female, aged 24, complained of cough and recurrent haemoptyses of ten months' duration. She stated that she had been investigated previously in hospital, and discharged as a case of "bleeding from the gums." She was admitted to Fazakerley Sanatorium, where routine clinical examination was negative. Direct *x*-ray examination by Dr. A. E. Connolly and lipiodol bronchography showed no pulmonary lesion. Her sputum was negative for tubercle bacilli, and her blood Wassermann reaction was negative.

We performed bronchoscopy with the consent of Dr. Crane, and this revealed an early carcinoma affecting the lateral aspect of the left main bronchus (Fig. 6, Special Plate). She was discharged from the sanatorium as non-tuberculous and admitted to the Royal Southern Hospital, where ten 1.5 millicurie radon seeds were inserted into the growth. Fig. 8 (Special Plate) shows the radon seeds in position and indicates the situation of the growth.

The morning haemoptyses persisted, and three months later, although physical and radiological evidence of disease was still absent, bronchoscopy showed that the neoplasm had progressed very considerably, and a further ten radon seeds were inserted into the growth. It was impossible to obtain a piece of tissue suitable for histological examination, but the clinical picture left no doubt as to the malignant nature of the tumour.

Malignant bronchial neoplasms do not give rise to radiological signs until the growth has spread so as to partially or completely occlude a bronchus, has infiltrated the lung parenchyma, or has given rise to secondary deposits in the mediastinal glands. We have encountered cases of proved bronchial carcinomata in which previous repeated *x*-ray examinations have shown no abnormality over periods extending up to two years. All such growths are infiltrative, they cause early fixity and rigidity of the bronchial wall with a consequent absence of the normal bronchial movements; and even before true tumour formation has occurred the bronchial markings will be distorted or absent, or the rings will appear to be drawn together. Thus a characteristic picture is produced which can be identified readily with the bronchoscope.

Several cases of haemoptysis due to secondary involvement of the trachea or bronchi from primary oesophageal or thyroid neoplasms without clinical or radiological pulmonary signs have been observed, but these have not been included in the series, as the causative lesion left no doubt as to the origin of the haemorrhage.

Technique

Except in patients who were very ill, bronchoscopy has been carried out with local anaesthesia. This is a safe and painless procedure if performed with gentleness and consideration for the patient, and it is no exaggeration to state that several of our patients have requested further bronchoscopic intervention following the relief they had experienced from therapeutic bronchoscopy. Anaesthesia is induced by preliminary spraying of one nasal fossa, the pharynx, and the laryngeal vestibule with a 5 per cent. solution of cocaine hydrochloride diluted with an equal quantity of liq. adrenaline 1 in 1,000 from a de Vilbiss No. 15 atomizer. A No. 5 gum-elastic catheter is passed through the anaesthetized nasal fossa, then through the glottis, and 2 to 3 c.cm. of the anaesthetic solution is injected directly into the trachea. Anaesthesia is sufficiently profound after a lapse of ten minutes to permit the passage of the bronchoscope with very little discomfort to the patient, and in no case has any anxiety been caused following the use of the cocaine and adrenaline solution of this strength. The bronchoscope is introduced directly into the larynx without the additional aid of a direct laryngoscope, as this latter manœuvre has been found

to cause pain to the patient. The type of bronchoscope which has been found to be of most service by the present writers is of special design, and it will be described elsewhere.

Diagnostic and therapeutic bronchoscopy demand unselfish team work and close co-operation between the physician, bronchoscopist, and radiologist, for in spite of the great value of this method of investigation there are great difficulties in it becoming readily available outside regular bronchoscopic clinics—a rigid technique, a complete set of good instruments, trained assistants, and a supply of suitable patients are all necessary.

Contraindications

The contraindications for bronchoscopic investigation of cases of haemoptysis of unknown origin are few, and are those dictated by common sense. A recent profuse haemorrhage, an exsanguinated or moribund patient, would naturally contraindicate instrumental intervention. Suspected pulmonary tuberculosis is not a contraindication to bronchoscopy, but the latter is rarely indicated in this condition. However, it has probably fallen to the lot of every endoscopist, wittingly or unwittingly, to examine tuberculous patients with the bronchoscope, and Myerson (1934) has reported a series of sixty cases of pulmonary tuberculosis in which routine bronchoscopy was performed without any ill effects. Accidents as a direct result of bronchoscopy are rare, and Scott Stevenson (1935) has stated that "collective statistics show that in 43,710 endoscopies performed by 190 bronchoscopists the mortality was less than 0.1 per cent., and that if one considers the bronchoscopy apart from the condition for which it was done there is no mortality—that is, no death occurred from the mere insertion of the bronchoscope." One death in the series reported above was due to an anaesthetic idiosyncrasy, and took place before the operation was begun.

Summary

Six cases of haemoptysis of unknown origin are described. The causative lesions of the haemorrhage in these cases have been found to be tracheal varix, simple bronchial granuloma, innocent and malignant new growths. Doubtless there are many other causes of haemoptysis which do not give rise to clinical or radiological signs, such as injury by foreign body, primary tracheal new growths, etc.; but these we have not encountered.

The routine employment of bronchoscopy in such cases is advocated, for, as Jackson (1934d) has stated, "every patient with haemoptysis if not proved tuberculous requires a diagnostic bronchoscopy—there is no need, therefore, to lay down any special list of indications."

Bronchoscopy, which is a safe and harmless method of investigation, affords the only possible means of making an early and positive diagnosis in cases of bronchial neoplasm, yet its value is not yet generally appreciated, and diagnosis is apt to be based on the inferential evidence of physical signs, *x*-ray examinations, etc., all of which may be misleading or entirely negative. Looper (1933) summarized these observations when he wrote that "in a review of the literature on the subject one is impressed by the great amount of attention which has been devoted to the study of clinical symptoms, signs, pathological reports, and *x*-ray observations, all of which offer little definite help in making a positive diagnosis, whereas bronchoscopy is the most important and most accurate aid of all, but is given scant recognition unless the article is by a specialist in the field."

There is no risk involved in advising a patient to undergo this method of investigation—on the contrary, much is to be gained. A differential diagnosis is urgent and essential in regard to prognosis and treatment, as from the patient's point of view all bronchial neoplasms are "malignant," whether histologically so or not, in that eventually they will give rise to complications which, if left untreated, usually prove fatal. Furthermore, if any successful treatment by surgery, radium, or *x* rays can be evolved for bronchial carcinoma its success will depend on the earliest possible diagnosis. The physician, therefore, should be prepared to "look and see," and not be content to "wait and see," as in the experience of the present writers the wait may be long before there is manifest clinical or radiological evidence of malignancy, by which time all hope of curative therapy will have passed.

Our acknowledgements are due to our colleagues who have generously allowed us to examine and treat their patients, and particularly to Dr. J. H. Mather and his staff for the many valuable radiological opinions and excellent *x*-ray films, without which it would have been impossible to record these notes.

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J. H. Zaaijer (*Zbl. Chir.*, November 14, 1936, p. 2714) condemns the coagulation of the prostate by means of diathermy. Instead he advises non-coagulation diathermy applied to the prostate by means of a special sonde. This is a "sonde coudé" made of ebonite with an active metal electrode of 175 mm.² at the concave side of the bend. The position of the sonde is controlled by means of a finger inserted into the rectum: 0.5 to 0.6 ampere is applied for one-half to one minute (in certain cases up to three minutes). Five to six treatments usually suffice for a cure, but occasionally as many as fifteen to twenty treatments may be required. The treatment does not cause coagulation of the prostate, only shrinking. It is not meant to replace prostatectomy. It should be applied only in cases where spontaneous micturition is impossible, while the patients are too ill for a radical operation. The author has treated 100 cases with this method. Spontaneous micturition was re-established in eighty-five cases. In seven cases the treatment failed (one case proved to be a carcinoma of the prostate) and seven patients died from different causes during the course of treatment. In fifty-three out of the eighty-five successful cases the cure was permanent. In cases of recurrence the course of treatment can be repeated.

THE RESULTS OF CORNEAL TRANSPLANTATION *

BY

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(WITH SPECIAL PLATE)

In this paper it is intended to present an account of the results of corneal transplantation as carried out by ophthalmic surgeons in recent years. The numerous operations during the hundred years dating from the early part of the nineteenth century were nearly all failures, and will not be discussed in this paper. Opinion in this country was summarized by Sir John Parsons in his textbook *Diseases of the Eye* in 1924 in the following words:

"Keratoplasty, or the excision of a small disk of scarred cornea, and its replacement by a disk of rabbit's or human cornea, is practically never successful; the transplanted tissue rapidly becomes opaque."

It is now recognized that successful results by corneal transplantation can be obtained, but conclusions as to the value of the procedure can only be based on published papers containing details of all the cases attempted—successes and failures—rather than on publications describing isolated successful cases. In this paper a summary of my own results will be given, together with those of Elschnig, Filatov, and Castroviejo.

Scheme of Classification

Inasmuch as the technique of the operation varies according to the ideas of the surgeon concerned, it becomes of interest to compare the results obtained by the different methods. Such a comparison is not easy, because the standard of success is not uniform, and the methods of recording results are individual and arbitrary. A scheme for the classification of the cases operated on is given in this paper, and a simple method of recording the results. If other surgeons would adopt this classification and summarize their results in a uniform manner it would greatly facilitate the comparison of results that will be necessary to establish the best operative technique. Complicated and involved schemes might be put forward, but probably the more complicated they are the less one could rely on the accuracy of the information conveyed. The simple scheme which is suggested would convey accurate and valuable information; the necessity for the various groupings is based on practical experience. It would indicate clearly under which headings the type of case, and the result, should be classified, and can be incorporated in the publication of details of cases as a convenient form of summary. The eyes should be classified into three main groups, and the results of each group given separately.

Group A.—Suitable eyes in favourable patients.

Group B.—Suitable eyes in unfavourable patients—for example, in a baby, or a patient with much nystagmus, much photophobia, etc.

Group C.—Unfavourable eyes, by reason of:

(*a*) Extra-ocular conditions—for example, symblepharon.

(*b*) Intra-ocular conditions—for example, anterior staphyloma, leucoma adherens, chronic iridocyclitis with secondary cataract, etc.

(*c*) Intra-ocular and extra-ocular conditions.

By the term "suitable eye" is meant an eye with an opaque cornea, a fairly normal anterior chamber, reasonably good tolerance of light, and normal tension. The conjunctival sac should be clean and free from gross abnormality. Some surgeons who find that results vary according to whether the cornea is completely scarred or contains some transparent tissue like to subdivide their cases on this basis. The above scheme could be adapted to this purpose by splitting Group A into two subgroups —(i) and (ii).

Scheme for Recording Results

In general the primary test of success is the degree of transparency of the graft and the absence of an opaque new membrane immediately posterior to it. The object of the operation is to produce a graft that will remain clear, and if this object is accomplished the operation must be considered successful, though it may be on a defective eye whose vision, even though a transparent graft, may be extremely poor. It is therefore on the basis of transparency of the graft after a period of, say, six months that the results should be analysed, rather than on the visual results, which so frequently require explanations and references to other abnormal states of the eye before they can be assessed at their correct values. This scheme does not preclude details of visual acuity from being recorded, and although intended as a useful form of summary can well be utilized as a classification for the publication of details of individual cases.

It should be clearly indicated whether the figures refer to the number of operations or the number of eyes operated on. The former is desirable as it would include all the failures, but there is no reason why both should not be summarized. The following six headings will include all types of results, and are suggested as easy groups for the classification of corneal grafts.

Successes	Group 1. Clinically transparent.
	Group 2. Slight degree of opacity in or behind graft.
	Group 3. Much opacity—but less than original corneal opacity.
Failures	Group 4. Much opacity—equal to, or worse than, original corneal opacity.
	Group 5. Graft detached.
	Group 6. Eye lost.

By classifying results in this way one can see at a glance how successful or how poor the results are. Groups 1, 2, and 3 are successful in their various degrees, and Groups 4, 5, and 6 are failures. I would emphasize the fact that a new formation of opaque tissue immediately behind the graft, so prone to occur in eyes with old iridocyclitis or leucoma adherens, must be considered as part of the graft, and however clear the stroma of the graft the endothelial opacity must be accepted and assessed for the categorical record of the result.

Results of Operations

For the purpose of comparison, and in order to form a true estimate of the value of the operations for corneal transplantation, one should know the results of all the operations of that nature performed by the surgeons concerned. Isolated reports of successful cases, although of interest and encouraging, do not form a true basis for an estimate of the chances of success of the operation and how the chances vary under certain conditions. Suc-

* Read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, Oxford, 1936.

cessful cases have been reported by Freiberg, Ask, Wright, Rycroft, and others. Colonel Kirwan of Calcutta has performed a number of these operations in India with good results, basing his procedure on my technique but modifying it in certain ways. The results of three surgeons who have published a report of all their cases, and my own results, will now be discussed.

ELSCHNIG

Professor Dr. Elschnig of Prague published an account of 174 operations; 139 of these were apparently on suitable eyes, and he obtained thirty-two clear grafts and thirty-three partially clear grafts: fifty-one were opaque and twenty-three grafts became detached; thirty-five operations were on unfavourable eyes, and of these two grafts were clear, six partially clear, and the results of the remaining twenty-seven were described as unfavourable, no details being given as to the number of grafts lost, etc. By Elschnig's technique—which follows largely on the technique of Von Hippel—it appears that 46 per cent. of grafts on suitable eyes were successful—in the sense of being clear or partially clear, but 16 per cent. of the grafts became detached. His best results were in a group of twenty-six cases of corneal opacity following interstitial keratitis, in which 73 per cent. were either clear or partially clear and only one graft was lost.

FILATOV

Professor V. P. Filatov published an account of ninety-six operations. Forty-eight of these were on thirty-eight unfavourable eyes, and he reports no successes, but gives no further details. The remaining forty-eight operations were on suitable eyes, and he divides these into two groups. The first group consists of twenty-two operations on corneae completely opaque; one graft was clear and seven grafts showed much opacity, but less than the original corneal opacity. The second group consists of twenty-six operations on corneae not completely opaque. In this group thirteen grafts were described as successful. From the details given it appears that ten were clear, two showed slight opacity, and one showed much opacity, but less than the original corneal opacity. Filatov's technique is based largely on Elschnig's technique, and it appears that 43 per cent. of grafts on suitable eyes were successful in the sense of being clear or partially clear. Details are not available as to the number of grafts lost. In cases of interstitial keratitis his successes were 66 per cent.

CASTROVIEJO

R. Castroviejo published a summary of thirty-two operations on twenty-seven eyes, and divided them into two groups. The first group consisted of eleven operations on corneae where the opacity was not complete and not dense. Nine of the grafts were clear or partially clear, and one eye was lost. The second group consisted of twenty-one operations on unfavourable eyes, in which were included those where the cornea was completely or densely opaque. One of the grafts was clear, but had a membrane behind it; seven grafts were clear. Castroviejo has accepted the principle of preparing the graft and the hole in the recipient cornea with shelving margins (which was established in my animal experimental work), and has elaborated his own technique, utilizing a rectangular graft in place of the round graft which I employ. Some of the eyes which he includes in the group of unfavourable cases should, in my view, be included in the group of favourable cases or in a subdivision of that group. I refer particularly to cases where the unfavourable factor is simply the extent or density of the corneal opacity. This makes it difficult to compare his results with those of other surgeons, and in future publications, if the scheme suggested in this paper were adopted, it would greatly facilitate the comparison. In a group of nine cases where details are given it appears that in four suitable eyes three were successful; one graft on a suitable eye in an unfavourable patient resulted in loss of the eye; four grafts on unfavourable eyes resulted in one clear graft and two partially clear. It appears that 50 per cent. of the thirty-two operations were successful, and in the group of cases described as favourable 81 per cent. were successful.

TUDOR THOMAS

The period covered by this summary of my results is from my first operation over five and a half years ago to the thirty-sixth operation three and a half months ago. The technique employed had been elaborated by experimental work from 1922, and was described in its relation to the operation on man at the Oxford Ophthalmological Congress in 1935. The results of the thirty-six operations are given in accordance with the scheme suggested in this paper.

Results of Corneal Transplantation

Results of 36 Operations on 32 eyes		Group A	Group B	Group C	
		Suitable Eyes		Unfavourable Eyes	
		In favourable patients	In unfavourable patients	(a) Extra-ocular Conditions	(b) Intra-ocular Conditions
Successes	Group 1: Clinically transparent	5	0	0	0
	Group 2: Slight degree of opacity in or behind graft	6 (15 = 83 per cent.)	1 — 3	0 — 1	0 — 2
	Group 3: Much opacity but less than original corneal opacity	4	2	1	2
Failures	Group 4: Much opacity. Equal to, or worse than, original opacity	3	2	5	4
	Group 5: Graft detached	0 — 3	0 — 2	0 — 5	1 — 5
	Group 6: Eye lost ...	0	0	0	0

Case I.—One of my cases in Group A was a patient (see Special Plate, Figs. 1 and 2) whose vision was improved by operation from fingers at two feet to 6/12 and 6/9 partly. She is able to read the smallest print, her graft is transparent, and the fundus of the eye is easily and clearly seen. She has practically a full field of vision, and is able to carry on an independent existence. This is my best result, and the best result so far obtained in this country, her vision being restored practically to normal. In several of my cases the fundus is visible by ophthalmoscopic examination.

Case II.—Another case in Group A was a patient (see Special Plate, Figs. 3 and 4) whose vision was improved from hand movements to 6/36. Her corneae were previously completely opaque. She was demonstrated recently to the Bristol Medico-Chirurgical Society. Her graft is transparent, and her vision would be much better if it were not for a slight degree of old-standing opacity in the lens. She had been unable to see her way about for ten years, but can now get about alone, and has read many books. (See also Figs. 5, 6, and 7.)

Commentary

One primary object in corneal transplantation is that the graft should unite, and the loss of twenty-three grafts in Elschnig's 139 suitable eyes, a loss of one in six, contrasted with the fact that my eighteen grafts on suitable eyes all became united, confirms me in my belief that the principle of cutting the graft shelving, which was determined in my experimental work, can be applied with advantage to the operation on man, because the operation performed by Elschnig differs from my own procedure essentially, although not solely, in that regard. In

suitable cases success by corneal transplantation, resulting in a clear or partially clear graft, appears to be as follows:

Elschnig	46 per cent.
Filatov	43 ,,
Castroviejo..	81 ,,
Thomas	83 ,,

This comparison would be rendered much more accurate if the scheme outlined in this paper were utilized as a summary in future publications on this subject. To put the results on a very broad basis, the results of all four surgeons (by various operative techniques) show that in 216 operations on suitable cases 110 were successful—that is, about 50 per cent.—and in 338 operations on all the cases, favourable and unfavourable, 131, or 38 per cent., were successful. These figures indicate that corneal transplantation is now an operation offering a good chance of improvement in a suitable case. The figures for my own cases would indicate that the chances of obtaining a graft that can be described as transparent are about 27 per cent.

I feel justified by the results quoted in stating that in suitable cases corneal transplantation has now ceased to be an experiment and is a practical procedure. That does not mean, however, that advance in this form of treatment will not take place in the future. By continuing to work on a certain form of treatment ways and means are discovered to render that treatment more effective, and to improve the operative technique. The experience of surgeons with their individual operations must be carefully considered with a view to the establishment of a technique which is the most reliable and which gives the best results. The future, I am convinced, will bring still better chances of success for the suitable cases, and there is some justification for the view that, with a continuance of earnest effort, it will become possible to do a great deal more for many of those cases now classified as unfavourable.

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M. Grunberg and F. Jonckheere (*Scalpel*, Liége, November 7, 1936, p. 2326) refer to a previous article (*Brux. méd.*, October, 1936, No. 52, p. 1854) in which it was shown that it is possible to demonstrate, by means of radiography, the site of a perforated gastric ulcer after suture. A case is reported in which a patient of 36 had suffered from a chronic gastric ulcer of the lesser curve. This had penetrated into the left lobe of the liver to which it was adherent. Operation for perforation was carried out, the liver being freed and a large indurated perforation, 2.5 cm. in diameter, was found. This was closed by a Lembert suture, which was placed across and at right angles to the lesser curve. A second sero-serous suture was inserted over this. Radiography fifteen days later showed the typical "figure of three" on the lesser curve where the perforation had been, and indicated that a Lembert suture placed just beyond the edges of the perforation will result in inversion of the edges. Two further cases are reported and illustrated in which the same method of suture was used for small perforations. In these cases radiography after operation showed an identical "figure-of-three" shadow as in the previous case. The article is illustrated with numerous diagrams and radiographs to show the application of the suture.

A NEW TREATMENT FOR CHRONIC LEUCORRHOEA

BY

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(WITH SPECIAL PLATE)

So long as the cause of leucorrhoea may be uncertain or, in some cases, unknown its treatment must be empirical. Whether the excessive mucus secretion of the cervix be due to an increase from structurally normal glands, under the stimulus of chronic inflammation, or to an endocrine disturbance the only method of arresting the discharge which at present has a good chance of success is by destruction of the whole mucous membrane of the cervical canal.

Earlier Methods

At first treatment was chemical. By the application of strong antiseptic substances such as iodized phenol, picric acid, formalin, or acriflavine in glycerin an attempt was made to kill the offending microbe. Incidentally, we may mention that up to the last few years the great majority of all leucorrhoeal discharges were regarded as due to infection of the cervix. But even if this is so a cursory examination of the histology of the cervical mucosa will show how impossible it is to kill an infection buried deeply in the recesses of its branched glands unless at the same time the tissue itself is destroyed. This is obvious clinically by the failure in so many cases to effect the slightest improvement, even after many applications of chemical agents. A later method of treatment was an attempt to kill the organism by diathermy or ionization. A certain measure of success attended these efforts, especially in the case of erosions of the cervix, but in general the leucorrhoea arising from the cervical canal after perhaps a temporary improvement is left unaffected.

Recently some workers have aimed at the actual destruction of the gland-bearing mucous membrane by the diathermy cutting curette or the electro-cautery (Ainsworth-Davis, 1934). If all, or nearly all, the glands are destroyed a clinical cure will follow, but though some results are conspicuously successful objections are that it is necessary to operate under anaesthesia, and that the cutting curette may cause a serious haemorrhage about ten days after operation. Further, it is not easy to strip the canal evenly, not too deeply and yet sufficiently to ensure the destruction of all the mucosa.

Preliminary Trials with Zinc Chloride

After having been disappointed by the various methods of treating leucorrhoea it occurred to one of us that if the whole mucosa of the cervix could be destroyed by one application of a chemical agent, without the necessity of an anaesthetic, there would be a prospect of a real and permanent cure. The substance chosen was a saturated solution of zinc chloride in water. The immediate difficulty in the early trials was to find a suitable vehicle by which it could be introduced and removed from the cervix without the danger of too large a dose, and of its con-

taminating and so burning the vagina. At first the salt was mixed with flour and kaolin, and later resin and olive oil. But all these bougies were unsatisfactory. They were difficult to introduce, and still more difficult to remove at the end of the treatment.

Finally, porous clay pencils were used in four sizes, 1¼ inches long and of different diameters. If these pencils are placed in a saturated solution of zinc chloride for ten minutes they will become fully charged with the salt and ready for use. In most cases there is no difficulty in inserting one of a suitable size without pain, and it is easy to remove by the wire passed through a hole drilled in the proximal end of the pencil. The absorption of zinc chloride by the tissues is fairly constant according to the size of the pencil and the duration of the application, and it is sufficient to produce necrosis of the mucosa extending about two to four millimetres deep.

If the dose of zinc has been insufficient, either because too small a pencil has been used or because the time of application is too short, the zone of necrosis will be uneven, or not deep enough to affect all the glands, and partial failure will follow, while, on the other hand, if the dose has been excessive necrosis may penetrate too deeply. In these cases a large slough, representing a cast of the major part of the cervix, tunnelled by its canal, may separate about the seventh day, but even though so much tissue has been removed we have never seen anything more than very slight bleeding at the time of separation, and in one or two cases, after removal and examination by the microscope, the canal was found to be of normal size and lined by epithelium.

Reasons for Failure

There are three chief reasons for failure. The dose of zinc chloride in quantity and time may be too small, so that the depth of necrosis is not enough to reach the deepest parts of the glands. If too much glandular epithelium is left untouched by the zinc new glands will arise and the amount of mucus will be as great as before. A second possibility is that the cervical canal is not circular in section but may be irregular, so that the round clay pencil while distending part of the canal may leave some recesses unoccupied. In this case those parts of the canal which have not been in contact with the pencil will be unaffected, and a source of persisting leucorrhoea. A third difficulty is the deeply lacerated everted cervix of the multipara. Here the canal is shaped like an inverted funnel, and it cannot hold the pencil in close contact with its walls. A very large erosion, too, will not be destroyed, but we have found that small erosions may disappear after treatment of the canal.

Indications and Advantages

The type of cervix which is most suitable for treatment by zinc chloride is the one which has not been deeply lacerated, and is therefore able to hold the pencil in close contact with its wall throughout its whole length. In a few cases, if there is a large erosion, it is necessary to give a general anaesthetic to allow its treatment by the electric cautery, after which the pencil may be inserted into the canal. Anaesthesia may also be necessary for a few patients who cannot tolerate a speculum or any vaginal manipulation.

The advantages of this method of treatment are that usually anaesthesia is not necessary; the pencil is easy to introduce; there is no discomfort during the time it is in position; only one application is necessary; and the results are almost uniformly good.

TECHNIQUE

The patient is placed in the left lateral or dorsal position and a Sims speculum is introduced into the vagina. In a good light and with the aid of a spatula to lift the anterior vaginal wall forward, it is usually possible to obtain complete exposure of the cervix and external os. The area is swabbed clean and the anterior lip of the cervix is gently grasped by a single-toothed vulsellum. Some women feel a little pain as the tissue is pierced by the teeth of the vulsellum, but if it is too much the instrument may be discarded.

Meanwhile each of the four sizes of clay pencil has been soaking in a saturated solution of zinc chloride for ten minutes. According to the apparent size of the external os a pencil of suitable diameter is taken by a ring forceps and passed into the cervix, which is steadied by the vulsellum, until its proximal end is flush with the external os or even just beyond it. The pencil should fit accurately into the cervical canal, and therefore if the size chosen passes too easily it should be removed and a larger size inserted. We have found that the most convenient size is No. 3 (1¼ inches by 1/4 inch), which has been used in 70 per cent. of our cases. It is sometimes necessary to use a certain amount of pressure to ensure that the pencil is completely embedded in the cervical canal, for it is most important that the proximal end should not project from the os. If it is not wholly contained in the canal it is very liable to drop out into the vagina. A strip of gauze, moistened with a 5 per cent. solution of sodium bicarbonate, is loosely packed around the cervix and firmly against the os to maintain the pencil in position. Sodium bicarbonate is used to neutralize any zinc chloride solution which might spill into the vagina and cause a burn. Where the pencil fits well into the cervix there is little chance of damage to the vagina, but if it has been impossible to insert it completely the bicarbonate solution in gauze is an essential precaution. The instruments are removed and the patient lies quietly for a period varying from two to four hours. No. 4 pencil remains for two hours, No. 3 for three hours, and No. 2 for four hours. At the end of this time the gauze pack is removed and the pencil is withdrawn by means of the wire attached to its base and projecting from the vagina. No further treatment is necessary.

The subsequent clinical course is as follows. For two or three days there is no discharge whatever; this is due to the complete necrosis of the mucous membrane, which has not yet begun to separate as a slough. About the third or fourth day it reappears, and increases until the sixth or seventh day, when a little blood is usually noticed. This corresponds to the separation of the necrotic mucosa as a slough, either in one well-defined grey mass or in the form of small particles and shreds. For a few days there is a profuse sero-purulent discharge, which gradually diminishes during the next four weeks, until finally there is nothing more than the normal moisture of the vagina. Occasionally it has ceased in a fortnight, while other patients have complained of it for six or eight weeks. Examination of the cervix through a speculum after two months, even if a large slough has been passed, in a successful case will reveal no abnormality.

Results

During the past two years we have re-examined forty-one of the women we treated for profuse leucorrhoea. Certain others who had been treated failed to return for examination and have not been included in this review.

Of the forty-one questioned and examined we may fairly report that twenty-seven can be regarded as cured, inasmuch as they stated that they were not conscious of white discharge, and by inspection of the undouched vagina no abnormal mucus or pus could be seen. Eleven women admitted considerable improvement, but were still conscious of some leucorrhoea, especially in relation to

menstruation, and three are no better. Of the eleven cases four still showed an unhealed cervix and three were found to have large and unhealed erosions. Another reason for failure which we have occasionally noted is subacute or chronic vaginitis, which may maintain leucorrhoea almost indefinitely if untreated.

Pathology of the Cervix after Treatment

An important point which obviously arises in the consideration of a drastic treatment of the cervical mucosa is the question of re-epithelialization of the canal after the mucosa has been discharged as a slough. If a new epithelium fails to grow the canal would be lined by granulation tissue, which would not only maintain a discharge but also would ultimately cause stenosis by contraction of its scar tissue, but if the denuded canal becomes lined again by epithelium there will be no danger of stenosis or discharge from chronic granulation tissue. In order to study this point and other histological changes in the cervix after the application of zinc chloride, pencils were inserted in the cervix of more than twenty women, chiefly cases of fibroids, on whom it had been decided to perform hysterectomy for various reasons. The time of insertion of the pencil before the operation was so arranged as to provide material for study varying from an hour to several weeks after the application of zinc chloride.

In assessing the microscopical findings in these cases it must be remembered that by no means all of them were suffering from endocervicitis. The changes observed, therefore, do not always show the reaction of infected cervical mucosa, but simply the reorganization of the average cervical canal before and after the discharge of the slough. The earliest specimens were obtained four hours after treatment. The mucosa is dull grey, and transverse section shows a clearly defined greyish-white zone around the lumen from two to four millimetres deep (Fig. 1, Special Plate). From the necrotic appearance of the zone it was anticipated that the typical signs of necrosis would be found microscopically, but in point of fact the histological appearances in these areas are those of perfectly fixed and preserved tissue both before and after the discharge of the slough, due to the fixative action of zinc chloride. The only abnormal feature seen in the necrotic area is dilatation and thrombosis of the blood vessels. Indeed, this is the only indication in the most recent specimens of the depth to which the zinc has penetrated (Fig. 2).

In the tissue deep to the zone a series of changes rapidly begins. After four or five hours the vessels are dilated and large numbers of leucocytes are already to be seen in the tissue spaces (Fig. 3), while a sharp line of demarcation occurs at the periphery of the zinc-affected area, which becomes more obvious as the inflammatory exudate becomes denser (Fig. 4). Between the two zones just described there is also a third narrow zone of coagulation necrosis, into which the inflammatory cells do not penetrate and which does not show the histological features as well as those of the zinc zone, which will subsequently form the slough. It is along this line that the slough will eventually separate.

The area of necrosis usually includes the majority but not all of the cervical glands. An occasional gland is deep enough for its fundus to escape the necrosing action of the zinc chloride (see Fig. 1), and it is chiefly from these remaining islets of epithelium that the new lining of the canal is developed after the slough has separated. In a few examples all the glands appeared to have been removed, and in these the canal was apparently relined by squamous epithelium extending from the external os. The depth of necrosis also varies in accordance with the closeness of contact of the pencil with the mucosa. If the pencil has been too small to fill or even distend the canal transverse section shows the line of demarcation failing to encircle the lumen completely. It will come to the surface in one area, leaving some glands entirely unaffected. This is particularly noticed where the cervix is patulous, deeply torn, or the cross-section of the canal shows a serpiginous outline.

During the first week there are the usual signs of an intense inflammation along the edge of the necrotic zone. Towards the end of the week there is an increasing necrosis of the narrow zone along the periphery of the slough, preparatory to its separation. The main mass is discharged about a week after the application of the pencil. Sometimes it is found intact as a complete tubular cast of the cervical canal. About the tenth day the cervical canal is lined with exuberant granulation tissue densely infiltrated with acute and chronic inflammatory cells, including numbers of plasma cells (Fig. 5), and containing some of the fundi of the deeper glands which open into the new canal. At this early stage the canal is already beginning to close down, and the first signs of epithelialization can been seen. After two weeks there is very little bare granulation tissue remaining, for almost the whole canal has been covered by epithelium growing out from the gland remnants; at first this extends from the glands as a single layer of flattened cells which rapidly multiply and heap up to form a layer many cells thick, resembling squamous or transitional epithelium (Fig. 6), and by the end of the third week the canal and even some of the more superficial glands are almost entirely lined by this squamous type of epithelium, while only the deepest glands retain the normal columnar cells. As the new epithelium develops so the inflammatory reaction in the subjacent tissues diminishes and finally disappears. During the third and fourth weeks the final stage in the relining of the canal begins; in the superficial layers of cells vacuoles appear, which coalesce to form vesicles (Fig. 7); by rupture of the vesicles the roofing cells are thrown off in masses, leaving a single layer of columnar cells, which was originally the basal layer of the squamous epithelium. This process continues until about the sixth week, by which time the canal is almost completely lined by columnar cells (Fig. 8). At first these cells show an exuberant growth in the form of tree-like folds, resembling small papillomata, but by the end of the seventh week the irregularities have all disappeared, leaving an even, regular layer of columnar epithelium. It is of interest to note that one cervix examined eight and a half weeks after the application of zinc chloride showed the greater part of the canal still covered only with granulation tissue. The only epithelial lining was found close to the external os, as an extension of squamous epithelium from the portio vaginalis; and in this specimen no gland remnants could be seen. In another case examined twelve weeks after treatment the entire canal was lined with squamous epithelium, and here again there was a complete absence of glands. It seems that re-epithelialization from the external os is a much slower process than when it is developed from surviving fragments of the glands.

It is possible to correlate the pathological processes and clinical progress. The first action of zinc chloride is to produce thrombosis of the mucosal vessels and rapid necrosis for a depth of about three millimetres. All glandular secretion therefore stops, and the vagina is found to be almost completely dry for about three days. Traces

of mucus reappear, which become mixed with serum, and then a little blood as the slough separates towards the end of the first week. The subsequent granulation tissue exudes a little serum, which gradually diminishes and finally disappears as the process of epithelialization is complete. The final cure, which we have noted in a large proportion of the cases, is due to the great reduction in the numbers and lengths of the glands.

Note by A. C. Adamson

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The applicators are made from a clay such as is used for the manufacture of filter candles. They are tapered to facilitate insertion and have a terminal hole for the attachment of the wire by which they are withdrawn. Tinned copper fuse wire (30 ampere) has been found most satisfactory. The following sizes have been used.

Size	Length	Diameter
1	1 inch	3 16 inch
2	1⅛ „	3/16 „
3	1⅛ „	1/4 „
4	1⅛ „	5/16 „

Before use each applicator is immersed in a solution of zinc chloride, 1 in 1 (a few drops of hydrochloric acid dissolves any oxychloride that may be present). The amount of the salt absorbed by the pencils during ten minutes' immersion is nearly constant for each size of applicator. I have estimated five of each size and find only a slight variation in the content of zinc chloride. The following is an average of the results.

Size	
1	absorbed solution equivalent to 2.34 grains zinc chloride
2	„ „ „ 2.73 „ „ „
3	„ „ „ 4.29 „ „ „
4	„ „ „ 6.6 „ „ „

A number of applicators were collected after use and the remaining zinc chloride estimated.

Size	Size of Applicator	Amount of zinc chloride absorbed by tissue	Per cent.
1	1 in. × 3 16 in.	—	—
2	1⅛ in. × 3 16 in.	2.13 grains	78
3	1⅛ in. × 1/4 in.	3.39 „	79
4	1⅛ in. × 5/16 in.	5.23 „	79

The applicators were made to specification by Messrs. A. Gallenkamp and Co. Ltd., and are also available from Messrs. Allen and Hanburys Ltd.

Summary

We have described a method of treatment of chronic leucorrhoea by destruction of the cervical glands by the necrosing action of zinc chloride. A saturated solution of the salt is applied to the cervical canal by means of a porous clay pencil, which has been soaked in the solution for ten minutes. In the majority of cases an anaesthetic is not necessary, for the insertion of the pencil causes little discomfort. A slough of the mucosa is produced and discharged in about a week. A number of sections of the cervix have been made at varying intervals after application of zinc chloride, which have demonstrated the complete re-epithelialization of the canal. The results to date show that of forty-one cases treated and examined afterwards twenty-seven are completely cured, eleven are definitely improved, and three are no better.

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ADHERENT FALLOPIAN TUBE CAUSING INTESTINAL STRANGULATION

BY

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"Bands formed by anatomical structures abnormally attached" are a well-recognized cause of intestinal strangulation. The commonest abnormality of this nature is an adherent vermiform appendix. In this case it was an adherent Fallopian tube which caused the abdominal catastrophe here described. Without facilities of reference to the literature I am unable to say whether this is a common condition; but as it is unique in my experience, and as the preceding and immediate clinical history present unusual features, a report of the case seems well worth while.

Case Record

The patient was a married lady of 69. The menopause had taken place at the age of 48. She first came under my care on February 15, 1936, for a complete procedentia uteri. This had been developing for thirty-five years, and beyond wearing a ring pessary at intervals no treatment had been sought. When first seen on this date the uterus was protruding two inches outside the vulva and the exposed portions were beginning to ulcerate. The uterus was replaced, a ring pessary inserted, and daily douches ordered. Apart from her age there was a moderate rise of blood pressure, a hypertrophied heart, and slight albuminuria, all seeming to contraindicate any operative treatment of the prolapse. On February 20 there was a sudden profuse discharge of half a pint of thick yellow pus from the vagina. Vaginal and rectal examination failed to disclose any disease in the uterine appendages that might be the origin of this purulent discharge, which in the absence of other causes was assumed to be intra-uterine in origin. The pessary was removed and treatment with douches, ichthyol tampons, and later with intra-uterine instillations of iodine in glycerin were tried. On March 10 the patient began to complain of frequency of micturition and burning. The urine, besides the usual trace of albumin, now contained a few pus and epithelial cells and was strongly acid: culture revealed a *B. coli* infection. Treatment by alkalis for ten days, followed by acidification and hexamine and a course of autogenous vaccine injections, cleared this up in four weeks: it is probable that there was an ascending urethral infection which had caused a mild cystitis.

The purulent vaginal discharge continued intermittently: for a few days there would be none and then several ounces would discharge unexpectedly. Repeated vaginal examination and inspection was still negative, and though pus could never be demonstrated coming from the cervical canal the trouble was thought to be a pyometra, and on March 18 dilatation and curettage was carried out, and the previous treatment with douches, tampons, and instillations continued. Thereafter the discharge gradually cleared up, and from April 20 was absent. On May 3 she was examined, and all traces of infection seemed to have gone; by then the cystitis, too, had cleared up, so the ring pessary was reinserted. During all this time there had been obstinate constipation, which failed to yield to dietetic measures and paraffin preparations, and for which daily doses of senna or cascara had been required. She was said to be subject to visceroptosis, and on March 21 there had occurred an attack of severe abdominal pain of a colicky nature, with vomiting, which had lasted all day and had been relieved only when the third turpentine enema, preceded by pituitrin, had brought away a large faecal accumulation. The pessary inserted on May 3 controlled the prolapse satisfactorily, and on May 6 the patient was convalescent in a chair.

On May 7 I saw her at 10 a.m., and was told that she had been in severe pain for two hours: the pain was of sudden onset, colicky in nature, occurring in spasms every ten to fifteen minutes. An enema, which brought away some

scybala with flatus, gave a little relief. It was decided, in spite of the previous attack of obstinate constipation on March 21, to withhold aperients and solid food by mouth. Hot poultices, four-hourly enemata, and belladonna were ordered. When seen again in the evening she was reported to have had a fairly comfortable day. The pain had diminished, and was now a constant ache in the left loin. There had been nausea but no vomiting, and flatus had been passed. The pulse, which was 104 in the morning, had dropped to 96, and there was no rise of temperature. The abdomen was soft, with no local tenderness or rigidity or palpable mass. Next morning, May 8, at 9.30 a.m., the condition had changed a little for the worse. The temperature was still normal and the pulse 100; there was nausea and retching without vomiting, and the pain was still an ache in the left iliac fossa and not very troublesome. There was a very little general distension of a soft abdomen, with a sensation of a mass without tenderness or rigidity in the left iliac fossa. The tongue was a little dry and the expression rather drawn and anxious, though she had slept at intervals and expressed herself as feeling better than on the previous day. No flatus had been passed during the night. Two turpentine enemata at half-hourly intervals were now ordered, each preceded by 1/2 c.cm. of pituitrin; each returned unchanged, without force and without faeces or flatus. Intestinal obstruction, which had been suspected from the first but seemed to be negatived by the improvement in the condition the previous afternoon, now seemed fairly obvious, and immediate operation was arranged.

Operation

I opened the abdomen by a mid-line subumbilical incision at 11.45 a.m. on May 8, with a tentative but fairly confident diagnosis of acute following chronic intestinal obstruction due to a growth in the distal colon. At first it looked as if a serious error had been made. The intestine, large and small, was collapsed, and no growth was palpable along the colon. On lifting the gut out of the pelvis the true state of affairs was revealed when a loop of tense, distended, plum-coloured gut was found bound down in the pouch of Douglas by a tight band in the region of the right broad ligament. It was impossible to deliver the gut through the opening into which it had passed until the band had been divided between clamps. The band was a flat ribbon, a quarter of an inch thick and one inch deep from above downwards; the outer end was adherent just below the pelvic brim; the inner end was continuous with the broad ligament. The band formed the upper boundary of a circular opening about three-quarters of an inch in diameter, the other boundaries being the peritoneum of the outer pelvic wall externally and the thickened edge of the broad ligament below and to the inner side. The atrophic ovary was a small nodule of fibrous tissue below and internal to this ring. The Fallopian tube was not recognizable as an anatomical entity. The strangulated gut was a loop eight inches in length about eighteen inches from the ileo-caecal valve. Withdrawn from its hernia, the usual doubt as to viability arose; peristalsis and colour returned slowly after hot saline compresses had been applied for five minutes. There were haemorrhages into the oedematous mesentery, and patches of a grey colour at each end of the loop where the actual strangulation had occurred. At this stage the pulse became imperceptible, and as resection would have meant death on the table the patches of threatening necrosis at each end were oversewn and the abdomen closed, leaving the strangulated loop immediately under the peritoneum with a rubber glove drain leading down to it. The operation lasted twenty-five minutes. During the afternoon the patient's condition improved considerably; pain ceased, vomiting did not recur, and flatus was passed. Intravenous gum-arabic-saline-glucose infusion with *B. welchii* and *B. coli* serum with cardiac stimulation led to such improvement in the general condition that the outlook towards evening seemed fairly good, but at 2.30 a.m. the patient somewhat suddenly collapsed and died. A post-mortem was not asked for, but there was nothing to suggest that perforation and peritonitis had occurred: rather the immediate improvement suggested that death was due to exhaustion in an old lady already seriously debilitated by so many other disorders.

Commentary

The case has been set out in some detail as it did not quite illustrate the classical clinical features of intestinal strangulation. Small intestinal strangulation is generally said to cause acute, persistent, and increasing pain at the onset, with marked collapse and persistent vomiting going through the usual stages from stomach contents to faecal material. Here the pain was intermittent and never very severe, collapse was almost entirely absent, and vomiting occurred only at the onset and did not persist. During the afternoon there was definite improvement, with a fall in the pulse rate and passage of flatus. The absence of distension was a very striking feature on opening the abdomen. The earlier attack of constipation may have been due to the passage of a loop of gut through the hernial ring, but it is difficult to see how such a condition could have undergone spontaneous reduction, and equally difficult to believe that the obstruction could have been incomplete at first so as to lead to the amelioration of the symptoms during the first eight hours. As to the actual causation of the band, it is possible that the outer fimbriated end of the Fallopian tube had at some remote date become adherent to the peritoneum lining the inner wall of pelvis: prolapse of the uterus must have pulled on these adhesions and intestinal movements have moulded the adherent tube into a band, leaving an opening below. Possibly the insertion of the pessary had in some way been the exciting cause of the passage of bowel through the ring, though there was an interval of three days between the two events.

N. Danbolt (*Tidsskr. norske Laegeforen.*, November 1 and 15, 1936, pp. 1161 and 1225) defines lues congenita tarda as a condition developing after years of latency in childhood, adolescence, or even adult life. Although the prophylactic treatment of syphilis during pregnancy has been supposed to have been well established in Oslo since 1920, Professor Danbolt has observed as many as sixty-six cases of lues congenita tarda at the Rikshospital during the past five years. There were twenty-four boys and young men and forty-two girls and young women in this material. In most cases the more pronounced manifestations of the disease appeared just before or during puberty. There were eight cases in which the first manifestations appeared before the seventh year and ten cases in which they did not appear till after the nineteenth year. Parenchymatous keratitis was the first manifestation in as many as thirty-seven cases, and there were altogether fifty-one cases in which disease of the eyes developed at some time or other. Indeed, disease of the eyes was the predominant manifestation of syphilis in this material. Syphilis of the bones and joints was the first manifestation in six cases, and in six other cases it made its first appearance in the skin or mucous membranes. There were seven cases in which syphilitic disease of the central nervous system was the first warning. Hutchinson's teeth were found in twenty cases and defective hearing in five. In many cases the patients were already so old that reliable information could not be obtained about their mothers during pregnancy; but the examination of thirty mothers showed that seventeen of them had been ignorant of their infection and had received no specific treatment for it, and that the remaining thirteen, though aware of their disease and given specific treatment, had not received any during their pregnancies. It will thus be seen that nothing effective had been done in these cases to prevent the congenital syphilis during pregnancy; and the lesson of this study is that even in a civilized community at the present time there is wholesale neglect of elementary precautions against the development of congenital syphilis.

Clinical Memoranda

Rupture of Aorta into Duodenum

I was called to a passenger train on June 18, 1936, to attend a man who was seriously ill. This man was found to be lying on his back in a first-class lavatory with his trousers down in a mass of blood and faeces. He was blanched and unconscious, and at first sight seemed to be dead. He was taken to a waiting-room on a stretcher and given a little brandy, which he was able to swallow, and from there to a nursing home, where from documents found in his bag his name and address were ascertained. He was seen later in the day in consultation with Mr. H. H. Rayner. His wife gave his age as 76, and said that generally he had had good health, with no dyspeptic symptoms. He had retired from active business, but still gave some attention for one day a week to his business interests. He had stayed one night at a hotel in a large city, but left by an earlier train than usual for his seaside home.

Examination showed a large amount of blood in the rectum, with clots, some of which were passed in bed. A pulsating tumour was felt in the epigastrium, which Mr. Rayner thought might be an abdominal aneurysm. Four hours after admission he rallied slightly, and his pulse was 124 and temperature 100.8° F. He was restless, and 1/6 grain of morphine was given every six hours. His blood was typed in case transfusion should be thought necessary. He improved considerably for two or three days and the haemorrhage seemed to be arrested, but he relapsed on June 22 and died early on June 23. Post-mortem examination of the abdomen showed the large intestine and part of the small intestine to be filled with blood and clots. The duodenum and stomach were examined, but there was no evidence of an ulcer. The third part of the duodenum was firmly adherent to the aorta. In the lumen of this part of the duodenum was a firm ball-like clot, which was so organized that it was at first mistaken for part of a growth. The posterior wall of the duodenum where it was attached to the aorta showed a perforation communicating with the aorta, which was very hard and calcareous. The third part of the duodenum, with a portion of the aorta to which it was adherent, was removed and sent to the pathological laboratory of Manchester University.

Professor S. L. Baker examined it, and kindly made the following report: "I think there is little doubt that it is a rupture of a small saccular dilatation of the aorta into the duodenum. The aorta shows a very severe calcified atheromatous change. Although atheroma is usually confined to the intima of the aorta, and does not appreciably weaken its wall, yet in this advanced condition one usually finds some thinning and also degenerative changes in the media, which on rare occasions result in small localized saccular aneurysms (usually in the abdominal aorta). In this case there appears to be a sac adherent to the duodenum, and as there is no visible evidence of inflammatory thickening of the duodenal wall on the edge of the rupture a chronic ulcer is unlikely—and of course an ulcer in this position would be very unusual. I suppose that there may well have been a leakage of blood into the duodenum prior to the rupture which might have suggested duodenal ulcer."

As already stated, there was no history of symptoms of duodenal ulcer, but leakage from the aorta may have occurred during the night or early morning while at the hotel. This leakage may have caused the patient to feel ill and induced him to take an earlier train than usual. On the journey a desire for bowel action made him visit the lavatory, and there straining while seated caused rupture, resulting in collapse and the condition in which he was found. Perforation of the aorta into the duodenum is so rare a condition that it seems worthy of record as cause of bowel haemorrhage resulting in death.

I am greatly indebted to Professor S. L. Baker, who has kept the specimen, for his interest and report, and to Mr. H. H. Rayner for reading the MS.

Warrington. J. S. MANSON, M.D.

Angioneurotic Oedema

The following case of angioneurotic oedema, occurring on board ship, is probably of sufficient interest to warrant reporting.

CASE RECORD

A passenger, aged 76, went to bed at 11 p.m. on September 12 feeling quite well. About midnight he awoke and found that his tongue was swelling up, but he did not send for medical aid until 2 a.m. By that time he presented a grotesque appearance, and it was hard to believe that he was normal three hours before. The tongue almost filled the mouth and was protruding between the teeth; it was not tender, and showed no signs of inflammation. Both sides of the neck, the submaxillary regions, and the lower lip were enormously swollen and tense. The patient was unable to articulate, but had no serious difficulty in breathing, although he was much troubled by profuse salivation. The temperature was 97.2° F., and the pulse rate was 90. Fortunately he was accompanied by a son, who was able to give the facts of the case. There was a history six months previously of a mild swelling of the tongue, which had disappeared in a very short time.

He was at once removed to the ship's hospital, and arrangements were made for laryngotomy should the necessity for it arise. Adrenaline, 5 minims, was injected subcutaneously, and thin pieces of ice were given the patient to suck. After about half an hour the swelling of the neck and tongue was definitely less tense, but meanwhile stridor and respiratory distress had developed. An occasional glimpse could be had of the throat, which was swollen and oedematous. A second injection of adrenaline, 7 minims, was given subcutaneously, and the throat sprayed with the same substance, after a dose of magnesium sulphate had been given slowly by mouth.

Within an hour he was breathing without serious difficulty. He steadily improved, and by 8 a.m. the same day his tongue was almost normal in size. The swelling of the neck had disappeared except in the submaxillary regions, where it persisted for another three hours. During the day 1/2 grain of ephedrine was given by mouth every four hours. Forty-eight hours after the onset of the attack the parts were quite normal and the patient was in his usual health, except that on both arms there was a mild urticarial rash, which soon disappeared.

There was no previous history of asthma, hay fever, skin eruptions, or any of the complaints usually regarded as being allergic in origin. The only departure from the usual diet was a raw peach, which the patient had eaten after dinner; he had had no gastro-intestinal symptoms. His blood pressure was 124/64 mm. Hg, and the urine contained small quantities of albumin and pus; this was probably due to an old-standing condition, as they were still present in about the same quantity three days after recovery.

COMMENT

The points of interest in this case are:

1. The extremely rapid onset in an elderly patient with no definite previous history to suggest liability to such attacks.

2. The apparent response to adrenaline.

3. The site of the lesion, requiring constant supervision of the patient.

I wish to express my gratitude to Dr. Gardner, the senior surgeon, whose advice in this case was invaluable.

DAVID R. HUGHES, M.B., B.Ch.,
Second Surgeon, R.M.S. *Empress of Britain.*

Reviews

RISKS OF MECHANIZED LIFE

Accidents and Their Prevention. By H. M. Vernon, M.A., M.D. (Pp. 336; 61 figures. 15s. net.) London: Cambridge University Press. 1936.

No purely negative appeal can touch a progressive people nor can reason divorced from emotion inspire them. Dr. H. M. Vernon deals with this dilemma at the beginning of his book and decides that the slogan "Safety First" while capable of being interpreted negatively can most certainly be regarded and taught positively. He deals convincingly with the theme that creative living is impossible if we do not handle our dangerous modern equipment with proper care. This book is a fully documented survey of the whole field of accidental civil hazards, and it is interesting and easy to read. It sheds a wealth of light into many obscure corners and shows up clearly the danger spots in our modern mechanized life. Among fatalities the two chief causes are road accidents (39 per cent.) and burns and scalds in the home (9 per cent.), which latter are equivalent to those caused in all the factories, mines, and quarries added together. This points to the urgent need for better domestic safety devices to protect young children. In industry it is estimated that accidents cost about £30,000,000 a year, of which 18 per cent. is compensation cost and 82 per cent. "hidden" or indirect cost, though this takes no account of the losses sustained in the family by reason of the workers' incapacity. It would not seem unreasonable to double the figure in reaching the full estimate.

The chapter on accident proneness is well done and very fair, and the perplexed layman will find in it a description of tests which should remove many difficulties. It is still common to find intelligent people unable to distinguish between something which tests a faculty directly in the manner of Snellen's type and a procedure which, though measurable, gives estimates of other apparently unrelated faculties only by correlation or inference. This is discussed simply and with admirable clarity. General sickness and accident susceptibility are shown in close relationship to one another, but it is a pity that while the excess of accidents to juveniles in industry is brought out there is no mention of the recent rate of increase. In 1928, in every 100,000 workers, juveniles had an excess of accidents over adults of 3 per cent.; in 1935 it was 22 per cent. The correlation with increased working hours would be an interesting one to determine. Fatigue is shown to be far less potent as a cause of accidents than is alcohol, but it is not quite clear that the author has sufficiently analysed his fatigue data. Much of the fatigue may be really boredom, which one would not expect to be so dangerous as a true physiological fatigue with a refractory period and consequent loss of accuracy.

Ventilating and heating engineers would do well to consider the effect of air temperature on the accident rate. High temperatures induce greater fatigue and more accidents, but excessive cold has ill effects too. Bad lighting and high speeds at work lead to an increase in eye injuries; particularly does defective lighting cause the worker to get too close to his job and thus lead to more foreign bodies in the eyes. In dealing with motor cars Dr. Vernon gives a well-deserved criticism of the failure of designers to consider the physiology and posture of the driver. Too often the field of vision is unduly obscured. So, too, in industry—machines are often designed so that reaching and stretching are inevitable. Controls should be placed to meet the needs of those who will use the machines. Young workers and women suffer much in this respect.

The high ratio of fatal to non-fatal accidents in the building trade (1 to 25) shows how dangerous is this work and how dreadfully careless many contractors are. The mania of people to get the roof on before the foundations are finished and to occupy a building before it is half complete leads to rush and to the neglect of proper care. This question of hurried contract work might have been investigated, though it is hardly fair to the author to find him further tasks in a field he has otherwise covered with such skill and painstaking care. The figures given for accidents in respect of lifting tackle add point to the criticism of rushed and hurried work. Railways are dismissed with honour, and it is obviously safer to travel by rail than by any other means, although the air seems safer than the road.

The whole question of safety education and safety organization is handled in a practical manner. Industrial first-aid arrangements come in for criticism. Sepsis is increasing, and it is obvious that much first-aid work is poorly done. Rush and tear in any concern leave little time for proper attention, and in any works of reasonable size a properly trained nurse ought to have the duty of taking charge of every accident, however trivial. An increased accident rate, provided that the severity rate is falling, need not of itself cause alarm if in fact it is due to a greater percentage of the accidents being reported and properly cared for. Many other points could be quoted which would make the basis for a good educational campaign. The education, however, must not be confined to the worker, nor even to the employer, though his duty is a heavy one. Architects, designers, and engineers must do their share, but society at large must determine how fast it wants to go in industry, on the roads, in the mines, and even in the home. There is a point beyond which the price is not worth paying, and we seem to have reached it. It is not only physical pace but mental pace. The author makes it clear that the environment, both physical and emotional, in which any work is done determines in a large measure the degree of safety (and, be it added, the degree of accuracy and efficiency) with which it is accomplished.

Dr. Vernon has written a first-class book which, if properly studied, should contribute very largely to the safety and happiness of workers in many spheres and to those who travel. It is the busy administrator who needs this book most, and it is admirably suited to the man who wishes to gather facts and data in a hurry. To those with more leisure and a mathematical mind there is a wealth of additional information to be extracted from the tables. If Dr. Vernon cares to pursue the matter a very interesting sequel might be written round the correlations between accidents, sickness, and general social and economic tendencies—a controversial subject, but well worth investigating.

A SURVEY OF SURGICAL PRACTICE

Textbook of General Surgery. By Warren H. Cole, M.D., F.A.C.S., and Robert Elman, M.D. (Pp. 1,031; 559 figures. 40s. net.) New York and London: D. Appleton-Century Co. 1936.

This work is dedicated by its authors to Dr. Evarts A. Graham, who points out in a foreword that the book is the outcome of a course which has for some years been given to junior students of the Washington University School of Medicine. The object of the course has been to present to the students a systematic survey of the whole field of surgery. This object the authors may be

said to have achieved. Essentials are dealt with from a modern point of view; if more extensive details of a particular surgical disease are desired by the reader he is given help by a bibliography which is placed at the end of each chapter and brings to his notice some of the more important monographs and recent papers on the subject with which the particular chapter is concerned.

In an otherwise excellent survey of the field of modern surgical practice the most disappointing section is that dealing with fractures. We do not agree with the statement in the section on the treatment of Colles's fracture that "the best position [for the hand] is in slight dorsal flexion, etc.," and it is to be regretted that treatment by the direct application of plaster with the hand ventroflexed is not insisted upon. There are a few inaccuracies in the index—for example, Colles's fracture appears as coller fracture and collar fracture—but on the whole the subject-matter throughout is well put together. The illustrations are particularly good, and include shaded and line drawings, diagrams, and photographs. The inclusion of photographs showing the histology along with pictures of the gross lesion appears to us to be a useful plan and likely to help the student. An appendix entitled "The Surgical History and Physical Examination" is one of the most valuable and important parts of the book, and in a future edition we should like to see it placed at the beginning, where it would serve the student as an approach to the main part of the text. We believe that this book may be safely recommended to medical students and will make an appeal to them. It is likely to prove popular both in the United States and in this country, not only among students but also with those practitioners who wish to revise their outlook on the practice of general surgery.

SPLENIC PUNCTURE

La Ponction de la Rate. By P. Émile-Weil, P. Isch-Wall, and Suzanne Perlès. (Pp. 148; 23 figures. 35 fr.) Paris: Masson et Cie. 1936.

This concise, clearly written, and well-illustrated monograph by Émile-Weil and co-workers, coming as it does soon after Dr. Everard Napier's report of 5,000 splenic punctures without accident (*Lancet*, 1936, **2**, 126) may stimulate English haematologists to make greater use of a method of investigation which has perhaps been too little used in the splenomegalies of temperate climates. The reasons for this neglect are, doubtless, the relative infrequency of obscure splenic enlargement in non-tropical areas, with consequent difficulty in obtaining experience in the technique of puncturing the spleen and interpreting the stained smear; and the fear of danger to the patient from puncturing the spleen in a primary blood disorder. This fear appears to be groundless, and the French authors have explored the spleen without accident in all forms of leukaemia and in the acute splenic tumour of infections. The only formal contra-indication to splenic puncture is a haemorrhagic disorder such as haemophilia.

The safety of the operation depends on strict adherence to the technique recommended, which is much the same as Napier's. The essential features are that when the needle is introduced into the spleen only one single swift movement of aspiration is made, the puncture being deliberately a dry one and the smears being made from the small amount of splenic pulp entrapped in the needle. The least satisfactory feature of the procedure is the difficulty of getting normal controls, because few will feel justified in puncturing a spleen which is healthy and not enlarged. The authors have relied on material aspirated at operation from spleens which were being removed on account of thrombocytopenic purpura, and there are, in addition, some data for the normal splenogram in the literature. To the haematologist, as distinct from the parasitologist and bacteriologist, the great value of the method is in differentiating infiltrative lesions of the spleen, such as leukaemia, Hodgkin's disease, and Gaucher's disease, from other forms of splenomegaly. Apparently it gives little or no assistance in separating the different varieties of haemolytic, vascular, and sclerotic reaction in the spleen. The bock is very readable, the arrangement is lucid and logical, and the production of the monograph at a reasonable price does credit to the publishers.

MOLECULAR PATHOLOGY OF INFLAMMATION

Die Molekularpathologie der Entzundung. By Professor Dr. H. Schade. (Pp. 100; 20 figures, 18 tables. RM. 5.50.) Dresden and Leipzig: T. Steinkopff.

In this book Professor H. Schade gives a short but extremely clear and simple exposition of his theories regarding the process of inflammation, a subject on which he has conducted researches for the last eleven years. His general theory is that the body tissues may be divided into three sections as regards salt and water distribution. First the circulating blood, secondly the tissue fluids and connective tissue, and thirdly the cell protoplasm. The capillary wall is freely permeable to water and electrolytes but impermeable to colloids, while the cell membrane has a complex and selective permeability. The state of swelling of the connective tissue is determined very largely by the reaction of the tissue fluids.

The theory of inflammation set forth is that it is initiated by injury to the cells either by mechanical or chemical agents or by bacterial invasion. The local consequences of such injuries are an increase in acidity, a sharp rise of osmotic pressure, and a rise of temperature. These cause the classical symptoms of inflammation. The author's theories are supported by a large mass of careful physical measurements made on clinical cases and on experimental animals. In general he succeeds in assigning fairly simple physico-chemical causes to most of the phenomena of inflammation, and the book summarizes work which constitutes a very interesting contribution to our knowledge of a process of fundamental importance in pathology.

ELEMENTARY PATHOLOGY

Elementary Pathology. An Introduction to the Process of Disease. By Keith S. Thompson. (Pp. 80; 29 figures, 3 coloured plates. 10s. 6d. net, interleaved.) London: H. K. Lewis and Co., Ltd. 1936.

The simplest teaching is notoriously the most difficult, and Dr. Keith Thompson's attempt to write an introduction to this subject has not overcome the difficulties in this task before which other potential writers have undoubtedly quailed. Such a subject cannot be simplified beyond a certain point, and over-condensation involves risks of serious omission, inadequate explanation, and statement so general as to be untrue or misleading. This book contains only 43 pages of letterpress, some of these composed of only a few lines, the remainder consisting of blank pages for additional notes by the owner, and a number of large photographic illustrations, many of which are excellent in themselves but insufficiently described to enable their features to be understood. The arrangement of subjects is orthodox in the main, but it is not clear why "ulceration" should have a chapter to itself at the end of the book, and the subject of blood transfusion might well have been

omitted. Not only does over-condensation frequently give a false impression of the process described, but the student is further misled by some actually untrue statements—for example (page 27), that macrophages ingest damaged cells "but do not touch bacteria."

It is a little difficult to adopt the point of view of the elementary student, and he may perhaps gain more from this book than appears likely at first sight; but while it is quite certain that he will still have nine-tenths of his subject to learn after reading it, there is a danger that he may have something to unlearn as well. It should be added that the publishers have circulated a letter to recipients of review copies stating that acknowledgements made in the foreword to four other pathologists for help in preparing the book imply no responsibility on their part for its contents.

VASCULAR CHANNELS OF THE SKULL

A Roentgenographic Study of the Vascular Channels of the Skull. With Special Reference to Intracranial Tumors and Arterio-venous Aneurysms. By Knut Lindblom. *Acta Radiologica Supplementum XXX.* (Pp. 146; 154 figures. 10 Swedish Crowns net.) Stockholm: P. A. Norstedt und Soner. 1936.

The importance to a surgeon of knowing how to interpret a radiograph of the skull is well borne out by Knut Lindblom's monograph with this title. The first part of the book gives a detailed account of the measurements of the vascular groves and foramina in the normal skull, and the remaining two-thirds deals with the variations associated with intracranial tumours and arterio-venous aneurysms. The work is splendidly illustrated with numerous skiagrams and drawings, and should be carefully read by all radiologists and neurologists.

Dr. Lindblom has had the advantage of collaborating with his colleagues in the departments of anatomy and pathology, and Professors Antoni and Olivecrona have provided the carefully worked-out clinical material which forms the outstanding feature of the book. The only tumour of the brain which produces any alteration in the vascular markings on the bone is Lindau's tumour of the cerebellum, but changes of diagnostic value, which are well shown in the pictures, occur with the majority of meningiomas, though it is strange that the bone should be more frequently involved in certain situations. It is also interesting to note how often widening of the foramina for the occipital emissary veins is associated with long-standing increase in intracranial pressure. The monograph is an excellent example of the benefit to be derived from intelligent co-operation between several specialists interested in the same problem.

Notes on Books

The Southend General Hospital is to be congratulated on its enterprise in producing *Contributions to Clinical Practice in Medicine and Surgery*, a collective work by members of the staff under the editorship of Dr. T. ROWLAND HILL, one of the physicians. As Dr. Hill states in the preface, it is intended that this volume shall be followed by a series of similar publications under the auspices of the hospital. The book is composed of original articles from all the departments, thus covering a wide clinical field. Among the twenty-four contributions are many of interest to the general practitioner—for example, the fracture problem, nasal deformities, and oral sepsis in relation to health. Others deal with unusual conditions, such as proptosis following arterio-venous aneurysm, hereditary haemorrhagic telangiectasia, and pericanalicular fibro-adenoma of the male breast. In addition to the senior members of the staff the medical and surgical registrars and the first house-surgeon are also among the contributors. The book, which extends to more than two hundred pages, is remarkable for the quantity and quality of its illustrations. Copies may be obtained from H. K. Lewis and Co. (136, Gower Street, W.C.1) or through any bookseller, price 12s. 6d.

Dr. R. CAMPBELL THOMPSON'S *Dictionary of Assyrian Chemistry and Geology* (H. Milford, Oxford University Press, 21s.) contains much information of historical interest to medical readers. Mentioned under the heading, "The Drugs from the River," are black and yellow sulphur, bitumen, and gypsum. The Tigris has several sulphur springs on its banks, and there are also sulphur mines eight miles from Mosul. Sulphur was used in fumigation, primarily to drive away evil spirits. It was also used, as nowadays, for scabies, and for many other conditions, such as "lichens on the face and leprosy, morphew, and nits in the hair." Bitumen, described by Pomet as stercus diaboli, still floats on the water near Hammam Ali. This has a high sulphur content, and was indeed regarded as black sulphur. Gypsum, "the white bank of the river," was employed internally for urinary troubles and menorrhagia. Reference is also made to various forms of arsenic. The book contains information on the ancient methods of pounding and crushing stones and glass, and the glass receipts of the seventh century B.C. It is primarily a work for Assyriologists.

The thirteenth edition of Dr. THOMAS LATHROP STEDMAN'S *Practical Medical Dictionary* (London, Baillière, Tindall and Cox, 35s.) reaches us less than three years after we published a notice of the twelfth. With this issue the work celebrates its twenty-fifth anniversary, having been first offered to the medical and scientific public in 1911. Work in preparation for the original edition occupied three years. Numerous changes have been made on this occasion to secure uniformity with the eleventh edition of the *United States Pharmacopoeia* and the sixth of the *U.S. National Formulary*, including the adoption of "the chemists' spelling of sulfur and the sulfur compounds with an *f* in place of the more familiar *ph*." Dr. Stedman has not thought it advisable to incorporate in the body of his dictionary the new terminology proposed by a committee of the Anatomical Society of Great Britain and Ireland by way of revision of the Basle Anatomical Nomenclature; an appendix, however, gives the equivalents of these words in terms of the B.N.A.

The thirteenth edition of *Halliburton's Essentials of Chemical Physiology* (Longmans, Green and Co., 9s.) appears under the editorship of Dr. J. A. HEWITT and Dr. W. ROBSON, thus continuing the long association with King's College, London. The text is no longer divided into elementary and advanced sections, and the section on organic chemistry has been deleted, thus allowing some new matter to be added without increasing the size of the book.

The eighty-ninth issue of *Who's Who*, for the year 1937, follows the style of its predecessors in format, typography, and general arrangement. Some 40,000 compact biographies of living men and women are included, and they occupy 3,722 double-column pages. Deletions and new entries balance each other in number, and many thousands of existing entries have been brought up to date. It is evident that the editorial staff are unremitting in the care they exercise during the annual revision of this valuable reference book, and the outcome of their labours does credit to the publishing house of A. and C. Black Ltd. The current edition of *Who's Who* has become part of the apparatus of modern life in this country, and no newspaper office or large business firm or social institution can do without it. The price remains at 60s. in buckram, or 63s. in leather-backed binding.

Preparations and Appliances

DIRECTOR FOR STRANGULATED HERNIA

Mr. LEONARD LEY (surgeon, Great Yarmouth General Hospital) writes:

In operating for strangulated hernia I have found great difficulty in adequately controlling and protecting the intestine by the ordinary winged director when dividing the neck of the sac. It occurred to me that if the director had wider wings, and particularly if a deep slot was cut on each side of the grooved director so that the wings could slide down over the neck of the sac, the intestine would be completely isolated from the field and unable to slide up and over the director and its wings, as it invariably does with the usual director.

I wrote to Down Bros. Ltd., and they have carried out my ideas most meticulously. I and my colleagues have since had

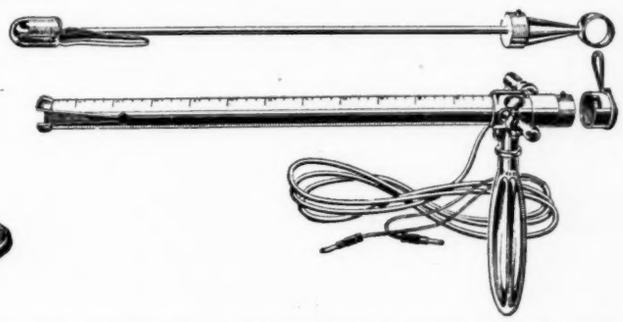
several opportunities of testing the instrument, and it has fulfilled all my anticipations. The accompanying illustration will demonstrate the modifications I have mentioned above.

I am grateful to Messrs. Down Bros. for the care they have taken in carrying out my suggestions.

OPERATING SIGMOIDOSCOPE

Dr. A. DREIFUSS sends the following note from Durban, South Africa:

The classical sigmoidoscope consists essentially of a metallic tube, open at both ends, with a handle and equipment for direct illumination and the blowing in of air. Simple polypi and adenomata cannot be operatively removed by this form of the sigmoidoscope. In the case of polypi which ought to be removed for biopsy or cure, an extensive and dangerous operation—for example, a modified "Kraske"—would be necessary. There are further indications for the removal of such simple neoplasms. In long-standing cases of colonic spasm, where no other aetiological factor can be found, polypi may have a stimulating influence on the neuromuscular apparatus of the bowel. This can result in exaggerated peristalsis or in excessive contraction of the sphincter muscles. In several such cases I found single polypi, and was faced with the problem of their removal without inflicting a major operation on the patient. I therefore modified the sigmoidoscope so as to make a simple operation possible. A triangular section of the tube, with its base at the foremost end of the tube and at its apex a circular hole, was removed from that part of the tube opposite to the electric bulb. The corresponding piece of metal was attached to the introducer,



so that this opening remained covered during the passing in of the instrument. This shield is essential to prevent injury of the bowel. When the sigmoidoscope is in position and the introducer has been removed the polypus can be brought into the triangular slit and so isolated from the rest of the bowel. The removal of the observation end-piece for the introduction of operating instruments does not then result in concealing the polypus by the prolapse of part of the bowel wall. If the light is obscured the operation can be completed by indirect illumination, as in the examination of the middle ear. The polypus can be drawn further into the tube by using long crocodile forceps of the ordinary pattern, and thus it can be simply removed by cauterization.

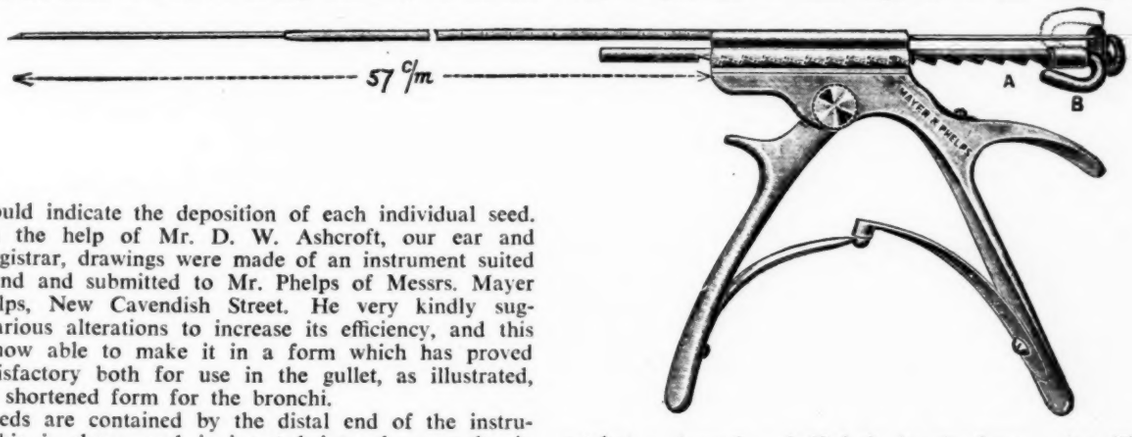
Using this modified form of the sigmoidoscope it became possible to treat with success a number of cases. The modified sigmoidoscope has been made to my design by J. Gardner and Son, Edinburgh, from whom it can be obtained.

A NEW RADON-SEED INTRODUCER

Mr. F. J. CLEMINSON (surgeon, ear and throat department, Middlesex Hospital) writes: In carrying out palliative treatment of carcinoma of the gullet by implantation of radon seeds I have never found an entirely satisfactory instrument. It seemed desirable to have something which, by an audible click, would indicate the deposition of each individual seed. So, with the help of Mr. D. W. Ashcroft, our ear and throat registrar, drawings were made of an instrument suited to this end and submitted to Mr. Phelps of Messrs. Mayer and Phelps, New Cavendish Street. He very kindly suggested various alterations to increase its efficiency, and this firm is now able to make it in a form which has proved most satisfactory both for use in the gullet, as illustrated, and in a shortened form for the bronchi.

The seeds are contained by the distal end of the instrument. This is sharp, and is inserted into the growth via the oesophagoscope for the required distance. The handles are then squeezed together and a single seed is deposited; this is indicated to the operator by a click. By the use of the scale shown in the illustration each seed can be put exactly where the operator wishes until any desired grouping has been obtained.

The instrument when fully charged contains ten "short Muir" seeds, each 7 mm. long. The method of loading is very simple, and in brief depends on the turning of the



ratchet A through a half-circle by the lever B (see Figure). This disengages the ratchet and allows it to be drawn backward. With it moves the stout wire which lies in the lumen of the instrument and pushes out the seeds when the instrument is in action.

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THE INFLUENZA EPIDEMIC

Memories of the ravages caused by the pandemic of 1918 and the publicity given to the present outbreak have made the public "influenza-conscious," and it would be well to study the subject in proper perspective and with due appreciation of what has occurred in previous years. Since influenza is not a notifiable disease it is impossible to get comparative data as to its annual incidence except by inference from the numbers of deaths and of the notifications of its principal complication—pneumonia. The last year in which there was anything approaching an epidemic was 1933. It started in the first week of the year and lasted for approximately seven weeks. The maximum number of deaths and of notifications of pneumonia were in the fourth and fifth weeks in London and in most of the great towns. The number of deaths in the fourth week in London was 641, and in the great towns 1,934; the figures for the seventh week being 130 and 630. Notifications of acute primary or influenzal pneumonia in London numbered 530 in the fifth week and fell to 190 in the seventh. The figures for 1934 and 1935, though much smaller, show an exactly similar rise and fall, the maximum number of deaths and notifications being in the fourth or fifth week.

The present outbreak assumed epidemic proportions early in December, and the numbers of deaths and notifications of pneumonia have increased regularly up to January 9. Examination of the available data shows that epidemic incidence was earlier in some of the great towns than in London and later in others. By analogy with events in other years there is every reason to believe that the peak has now been reached and that a steady though very gradual decline will soon show itself. The data so far available justify the expectation that the number of deaths will not approach the figure for 1933, and there is strong evidence that the number of cases is greater in proportion to the number of deaths and notifications of pneumonia than was recorded in that year; in other words the disease is of a milder type. That it is widespread and unaffected by considerations of sex, physical condition, and social status is shown by the prevailing dislocation of trade and other activites varying from agriculture to professional football. It is rife on the continent of Europe, in the United States, and even in Australia, as evidenced by the recorded transient illnesses of prominent men in different parts of the world. Elsewhere in this issue appears an interesting description of an outbreak in 1935 in the Falkland Islands, from which two points stand out: the rate of attack in an isolated community, and the suggestion (well worthy of the fullest consideration) that meteorological conditions have some influence on the course of the epidemic. From none of these countries or places comes any evidence that the disease is assuming, or is likely to assume, the characteristics which make the 1918 visitation such a tragic memory. The clinical features are headache and oculomotor pains (often extremely acute), backache, tracheitis, laryngitis, and rhinitis, with temperature raised to about 102° and persisting for twenty-four to forty-eight hours; varying degrees of bronchitis and prostration follow, which may persist for a week or more. So far, when pneumonia has supervened it has been of a simple bronchopneumonic or interstitial type, and although instances of the dreaded "heliotrope" pneumonia have occurred they are exceptional: toxaemia is not a general feature. Most of the cases of pneumonia have been in elderly people, and most of the deaths have been in the age groups over 55 years.

There is no royal road to prophylaxis; the healthy seem to be just as likely as the unhealthy to fall victims. Avoidance of stuffy atmospheric conditions in the home, workplace, or conveyances, and observance of the common-sense rules of health are obvious measures too often ignored. It is foolish both for the individual and for those with whom he has to mix to attempt to carry on once the prodromal malaise has appeared; it is equally foolish to insist on returning to work before the temperature has been normal for two days, or longer if circumstances permit. The depression which is such a common sequel is a very real thing, and in influenza, more perhaps than in any other disease, it is wise to hasten slowly.

PREVENTION OF RHEUMATISM

"We are still in the intelligence stage of the affair. The time hasn't yet come for a plan of campaign and still less for action."

These words from John Buchan's novel *Mr. Standfast* may be applied at times to most medical–social enterprises which go on from one stage to another. Sometimes fulfilment, or action, attempts to run in advance of policy and even of the ascertained facts; and sometimes, perhaps more often, effective action lingers very far behind both facts and policy, for it requires not only industry and

wisdom but courage. To ensure a well-ordered progress we must review the position periodically. What has been gained or lost? What data are still lacking in the basis of facts? Can these be supplied simply by agreed records and statistics, or what investigations or special research should be undertaken? Ought the original policy to be modified in aim or scope according to the information coming to hand, or, again, has the time come for initial steps to carry the policy into effect in one direction or another? Such a stocktaking seems now called for, following the efforts recently made in many countries to discover the causes and the best methods of preventing the development of the chronic rheumatic diseases. The fifth biennial International Congress on Rheumatism took place last year in Sweden.[1] The many communications made at these congresses and elsewhere during the past ten years fall naturally under three headings, dealing respectively with research, treatment, and the social and economic problems of industrial rheumatism. In all these studies there is a purely scientific purpose, which may be described as the intelligence service, and also a practical purpose, for the prevention and treatment of these diseases. There is indeed room for a great variety of work in a campaign against rheumatism. It is therefore not surprising that in some countries the scientific objective has so far been mainly followed, and that in others, especially those with long experience of national health insurance, the social objective has been predominant.

England leans to scientific studies. A committee of the Royal College of Physicians has published two large reports in book form, dealing mainly with medical problems and also with the pressing question of nomenclature and classification. A more widely representative Empire Rheumatism Council has now been formed. On the practical side the "Demonstration Clinic" of the British Red Cross Society, treating large numbers of patients every day, reports, after five years' work, good results in a great majority of cases, especially in those types of disease which are likely to benefit from ambulatory treatment. Committees on rheumatism have lately been formed in Ireland and in Canada. The St. John Clinic and that of the London General Omnibus Company have been opened in South London, and an increasing number of patients have been treated under new arrangements at the British spas. In the United States the work so far is mainly medical–scientific. The American Association for the Study and Control of Rheumatic Disease has published in its proceedings an "Examination of the Present Status of the Problem of Rheumatism," with full reports of new work and a general review of literature. The corresponding activities in France are recorded in a *Revue de Rhumatisme*. In the countries of Central Europe large numbers of young and middle-aged adults are treated under national health insurance at the spas and town clinics, but adequate medical reports are lacking. In Hungary it is stated that within the last ten years grave deformity and stiffness are less common and much movement is saved which was formerly lost. It is also reported that excellent preventive treatment is carried on at the Hungarian spas.

In Sweden the economic argument was the main incentive to a comprehensive national movement, for rheumatic disease was first recognized in that country as laying the heaviest charge upon social insurance. During the last few years a system of special sanatoria or hospitals has been developed for the care of arthritis, and reports of this work are now coming to hand. Careful percentage measurements of industrial capacity are made, first before and then immediately after a course of treatment, and also after the lapse of two or three years, and it is stated that the results obtained are beyond expectation. The local authorities co-operate with the Government in erecting these special hospitals, which are directed by specialists in rheumatism and where every desirable form of general or local treatment may be obtained. These institutions are "financed by loans redeemable in fifty years by the payments of patients, two-thirds of which are provided by the Board of Pensions." There are at present seven of these hospitals, and seven more have been sanctioned. Sweden is not an industrial country, but the incidence of arthritis is very severe, especially in women, and the impressive results of a carefully co-ordinated policy under Government direction were fully recognized at the recent congress in that country. In the Soviet Republics the programme of the Committee on Rheumatism in 1932 was included by the Commissar of Public Health in the Government measures for 1933–7, and a considerable sum voted for it. A more comprehensive programme is now being formed, which should be included in the five years plan for 1938–1942. A chair in rheumatology was set up in 1935 at Sotchi, with a balneological institute and 150 beds. A reduction in the number and severity of rheumatic cases is claimed, especially in factories in which preventive measures have been installed. Much stress is laid upon "social pathology."

These efforts in northern countries to counteract rheumatic disease in its earliest stages and to prevent the development of rheumatoid arthritis are certainly encouraging. Dr. Fortescue Fox, in a recent lecture at the St. John Clinic, held that

[1] "Problems of Rheumatism," *British Medical Journal*, 1936, 2, 604.

the evidence was now sufficient to warrant a careful national policy in England, based upon these results. This should comprise three parts: (1) prevention, the first and cardinal object; (2) curative treatment, for the two main categories of rheumatic disease—for those patients who only require ambulatory treatment and for those more seriously affected (for example, by rheumatoid arthritis), who need care in special institutions; (3) palliation and functional re-education, which is always well worth while. Considering the proved advantages of ambulatory clinics, both for preventive and curative work, it is surprising that they are not to be found in most of the great cities. At such clinics the strong reactions produced in rheumatic subjects by various forms of treatment would naturally be measured and recorded, especially their effects on the skin, the locomotor organs, and the circulation. It seems a pity that so little work of this kind has been done and that we still have to rely on the researches of Winternitz and his pupils fifty years ago—and even those not on rheumatic patients!

The problem of the prevention and cure of rheumatism cannot at this stage be solved by research, but only by the clinical–experimental method, guided by research—in short, by action.

THE MIDDLE-AGE SPREAD

Fat people may be jolly, but their mirth is too often short-lived. The increasing girth that goes with middle-age, affluence, and physical slackness brings in its train a number of disabilities not immediately apparent to the eye. These were discussed in a recent article by Drs. Wm. J. Kerr and John B. Logan of San Francisco.[1] The gradual accumulation of fat in the normal depots fills out the figure to the point of benevolence, but is relatively symptomless. In the fourth decade this accumulated fat may lead to alterations in posture, accompanied by presenile changes which bring about flabbiness of muscles, atheromatous changes in the blood vessels, and a gradual loss of elasticity and reparability. Tone is consequently lessened, and response to injury such as strain of muscles and ligaments or pressure on bone and cartilage is poor. The most obvious result is the gradual development of a heavy pendulous abdomen. This, the authors point out, causes a shifting of the centre of gravity of the body forwards, and the dragging effect makes itself felt chiefly in the lumbar spine, to which the weight is transmitted through muscle, fascia, and skin. There is first an exaggeration of the normal lumbar curve and later an increasing lordosis. Secondary effects are compensatory thoracic kyphosis and a cervical lordosis. There is increased plantar flexion of the foot at the ankle-joint and later a partial flexion of the knees. Thoracic kyphosis is perhaps the most important effect of all, in view of the influence it has on respiration. Increase of the normal curves of the dorsal spine results in elevation of the ribs, producing a barrel-chest. The lower ribs are directed downwards, and this, with the widening, results in flattening of the diaphragm and consequent reduction of pulmonary ventilation, manifested by dyspnoea on slight exertion. The authors contrast the aspects and symptoms of these patients with those of the later stages of pregnancy. Prophylactic treatment would, of course, be the most rational, but those with a tendency to exogenous obesity disregard the laws of conservation of energy through ignorance or neglect. The authors suggest as methods of treatment, (1) temporary elastic support of the pendulous abdomen; (2) reduction of weight, which must be planned for each patient, depending on occupation, opportunity for exercise, and general physical state: the diet should be one of 800 to 1,000 calories a day, and the aim should be to lose one to three pounds a week until the patient reaches the ideal weight after a period of six months; (3) postural exercises, chiefly those which teach the patient to stand and walk properly. Postural training is of greater value after the adipose tissue has been reduced, and is of little help to the patient whose abdomen is still pendulous.

[1] *Ann. intern. Med.*, November, 1936, p. 569.

RESEARCH ON INFLUENZA

The predicted epidemic of influenza is now in full swing, and the efforts of those who are seeking some means of controlling this disease have therefore a topical interest. Progress has recently been made in two directions, each of which was the subject of a paper read at the meeting of the Pathological Society last week. Several workers both in the United States and in this country have been studying the antibody content of the blood by protection experiments with the virus, and have found, generally speaking, that whereas children have comparatively little most adults possess a demonstrable amount of circulating antibody, the legacy of a past attack. This age variation, though in one sense what might be expected, is difficult to reconcile with the age incidence of the disease, since children, who should be most susceptible, are certainly not the principal sufferers in an outbreak like the present one. For accurate quantitative results from protection tests very large numbers of animals are needed, and L. Hoyle and R. W. Fairbrother have therefore adapted the complement-fixation test to this study, with results which suggest that it serves the purpose, since convalescent sera from Leningrad, where there has lately been a severe outbreak, showed an exceptionally high antibody content by this method. Observations with a large number of other sera gave results similar to those previously mentioned in relation to age. Another consequence of this type of work has been to establish a close serological relation between the viruses of human and swine influenza, because a serum which protects mice against one will also protect against the other: it has even been suggested that the two are identical. Hoyle and Fairbrother gave reasons for believing that although the two viruses have one important antigenic component in common there is another in which they differ. Meanwhile C. H.

Andrewes, Wilson Smith, and C. H. Stuart-Harris have reached the point of attempting prophylactic vaccination. This has been tried in the United States by subcutaneous injections of living virus, a procedure which, although it may prove free from risk, is naturally a little alarming. The English investigators have contented themselves with using a virus suspension inactivated with 1 in 5,000 formalin: this has been shown to be capable of immunizing ferrets, and the administration of two doses to sixty human volunteers was followed by an increase sometimes amounting to twenty-five-fold in the antibody content of their blood. An experiment is now in progress which may decide whether this form of vaccination does actually protect against the disease. Its drawbacks are that the vaccine itself is a virus suspension obtained from the lungs of mice and contains mouse protein which cannot be eliminated without a serious reduction in the virus content, and that the protection afforded by an inactivated virus is not likely to extend beyond one epidemic period. If the present experiment is successful immunization will thus be a possibility, but with reservations concerning the mode of preparation of the vaccine and its present suitability for general use.

EXPERIMENTAL STAINING OF THE RETINA IN LIFE

Vital staining of the living tissues has a long history. Antoine Musard in the sixteenth century fed dogs with madder and saw that their bones became red. Rutherford and Gibson in 1736 repeated the experiment. Heidenhain in 1878 did much to elucidate the minute anatomy of the kidney by injections of indigo-carmine. Vital staining of leprosy bacilli is well known. The retina is transparent and can be seen with the ophthalmoscope only when it is diseased, as when exudates and haemorrhages mark it or detachment makes it opaque. In a paper read before the Ophthalmological Section of the Royal Society of Medicine on January 8, Messrs. Arnold Sorsby, A. Elkeles, G. W. Goodhart, and I. B. Morris made a preliminary communication of experiments devised to stain the living retina and so render it visible on ophthalmoscopic examination. The difficulties in staining the retina are bound up with those that have been met with in staining the central nervous system. There appears to be a "barrier" between the blood and the nervous tissue which holds back many substances circulating in the blood and prevents their reaching the cerebro-spinal fluid and the brain. The mechanism of this barrier is in dispute, but that it exists is undoubted. The difference in the composition of the blood and the cerebro-spinal fluid points to it. The barrier holds back from the brain colloids in the blood stream and toxins and some medicaments. It protects the brain, but it is also an obstacle in the treatment of cerebro-spinal syphilis. Much work was done on the problem by Goldmann in 1913. He held that the choroid plexus played the dominant part, for trypan-blue was found mobilized in the plexus and did not reach the brain. He thought the barrier was insurmountable. Recent work has, however, shown that the barrier is not absolute. It is so for acid dyes but not for basic dyes. Experiments with acid dyes failed to cause staining of the retina. Most basic dyes are highly toxic. "Light green S.F." was found to be non-toxic. Injected into the rabbit it produced transient staining of the healthy retina. When degenerative changes had been set up in the rabbit's retina by previous injection of sentojod (a colloidal iodine preparation which has a selective and injurious action on the retina) injections caused the same transient staining followed later by irregularly distributed and intensive coloration. The injection may be made either intravenously or intramuscularly. Teased specimens of the fresh retinae demonstrated the presence of the stain in the cells. A number of rabbits with retinae stained a brilliant green were shown at the meeting for examination with the ophthalmoscope.

CONTROL OF VENEREAL DISEASE IN FRANCE

Our Paris correspondent foretold a few weeks ago that the Minister of Public Health, M. Henri Sellier, would soon introduce a new scheme for the reform of the administrative control of venereal disease and of prostitution. M. Sellier has now issued his draft of a new law concerning venereal disease, prostitution, and all its ancillary services. It will be remembered that the regulation of prostitution in licensed brothels by the French Government has hitherto survived the disparaging comparisons made between France and those countries in which the official countenancing of prostitution under medical control has been abandoned with a subsequent decline in the incidence of venereal disease. The French Government has latterly been not a little embarrassed by the equivocal position into which its representatives have been manœuvred on international commissions concerned with conventions for control of the traffic in women and children. The Frenchmen on these commissions have found it difficult to make their national standard in these matters conform with an international standard set by certain other countries. Perusal of M. Sellier's scheme gives a cheerfully Draconian impression; if it can be put into force with administrative success it should be a terror to evil-doers. Doctors will henceforth have to draw the attention of every new patient suffering from venereal disease to the terms of the new law, and if the patient acts in a manner calculated to be injurious to himself or to others the doctors must notify the case to the public health authorities. The conditions under which the communication of a venereal disease is punishable are defined, and permission is given to the public health authorities to require a medical certificate of persons suspected of transmitting venereal disease to others. The public health authorities must, however, have very good reason for suspecting such a person before this demand is made. The scheme also provides measures calculated to prevent the transmission of syphilis in the act of wet-nursing, and penalties for such transmission in appropriate cases. The patient who neglects the specific treatment recommended him may be subjected to coercive measures, and severe penalties are attached to the habitual debauching of

persons of either sex even when they are of age. The scheme also provides for special training in venereology in the medical curriculum, and no drug for the treatment of venereal disease is to be sold or employed in a public institution unless it is acceptable to the public health authorities, who will also refuse to recognize the serological tests of laboratories which are not officially approved. It will be seen from this summary that M. Sellier's scheme is a bold blow not only against the white slave traffic but also against quackery. It is still too early to form an estimate of the reaction of the medical profession to this scheme. The delicate question concerning professional secrecy may chill the potential enthusiasm of some doctors for it. On the other hand, the clauses aiming at the discouragement of the quack and his remedies will be greeted by the medical profession with unreserved satisfaction.

HEALTH IN THE SUDAN

The report on the Sudan Medical Service for 1935 is a most informative document, provided with an index and an excellent map. The medical administration of this vast area is carried out by a mere handful of British officials. Apart from administrative officers and specialists, there are only thirty-three medical inspectors and fifteen sanitary inspectors. These are assisted by a much larger staff of Sudanese, who have now almost entirely replaced Syrians in the subordinate positions. There are, in addition, a few mission hospitals, staffed by one or more British doctors. Considering climatic and other conditions, the health of British officials in the Sudan is exceptionally good. During the year under review, of 798 officials only one died and only three were invalided, while the average days' sickness per head was 1.32. These figures reflect credit on the Sudan Medical Service, though they are doubtless partially attributable to the generous leave regulations in force. The incidence of small-pox is remarkably low in the Sudan. Twenty-eight cases of mild type were reported from the Wau district, and the only severe cases, three in number, occurred among pilgrims returning from Mecca. Rabies is increasing and is now endemic in all parts excepting two districts of the Northern Province. Ten human cases were reported. Hyenas, jackals, and stray dogs form a reservoir of infection impossible to eradicate, while infection may be spread by the Arab sheep-dogs, whose nomadic masters traverse wide stretches of country. During the year 3,249 cases of cerebro-spinal meningitis with 2,154 deaths were reported. As in 1934, there was a severe outbreak in the Kordofan Province. The usual therapeutic measures proved of little avail, but the experimental administration of vitamin A extract as a prophylactic showed favourable, though inconclusive, results. Reliance was chiefly placed on such general measures as propaganda, evacuation of villages, and quarantine. In one instance where every precaution had been taken and the roads from an infected district had been picketed, a further outbreak was started in a fresh area through one man evading the police cordon. Experience has shown that the onset of the rainy season causes a temporary cessation of an epidemic. If a village has suffered heavily before the rains it is usually free during the next dry season; if only a few cases have occurred the second outbreak is often severe. Among the Sudanese attention has been paid to midwifery and child welfare even in rural districts, while the subnutrition of the natives, especially prevalent in Southern Kordofan, is being combated by the planting of fruit and vegetable gardens. The sanitary control of aircraft becomes increasingly important. All machines entering and leaving the Sudan are inspected and disinsectized. The number of these mosquito inspections for the year was 1,394.

ARACHNIDISM

Some time ago we commented[1] on the habits of the "black widow" spider, one of the more unpleasant inhabitants of the Southern States of America and many other warm countries. She is so called because she devours her husband; she is a coal-black, glossy insect about half an inch long, with a span of between one and two inches and a globular abdomen bearing on its under side a bright red spot, usually in the shape of an hourglass. The male is rather larger and has the same abdominal markings, and also a row of orange spots down the middle of the back, three orange stripes on his side, and straw-coloured bands on his legs. These spiders live in dark and dry places, very often near dwellings. The web is irregular and characteristic, for its threads criss-cross at various angles and in many different planes. The bite is poisonous, and most of the cases occur in the late summer and autumn, when the spiders are most numerous. Dr. A. S. Hargiss contributes in a recent paper some more valuable information on this pest and the results of its bite.[2] The toxin seems to stimulate the myoneural junction or to act on the nerve endings. There is no lasting immunity and serotherapy has been disappointing. The symptoms are startling and dramatic. The patient rolls and tosses about the bed in intense agony and may cry out at times. The pain may be lancinating, cramping, aching, or constricting, and sometimes comes and goes. It spreads slowly from the place of the bite until the poison reaches the general circulation, and then it spreads rapidly to all the large muscle groups. One of the best accounts is the personal experience of Blair.[3] Some patients have profuse cold perspiration, subnormal temperature, difficulty in breathing, restlessness, anxiety, and other symptoms common to acute medical or surgical emergencies. There is board-like rigidity of the abdomen, intercostal muscles, and muscles of the back. The extremities are spastic and the reflexes are generally hyperactive; localized tenderness is uncommon. The most important part of the differential diagnosis is from an acute intra-abdominal lesion. The mortality is low—2 or 3 per cent. Treatment is empirical, and the method recommended by Dr. Hargiss comprises hypodermic injections of 1/4 grain of morphine sulphate repeated as often as may be necessary; intramuscular calcium gluconate; intravenous glucose; a hot bath for an hour or more; plenty of blankets kept warm with a radiant light; copious fluids; and thorough elimination.

[1] *British Medical Journal*, 1935, **1**, 836.
[2] *New Engl. J. Med.*, 1936, **225**, 489.
[3] *Arch. intern. Med.*, 1934, **54**, 831.

JOHN E. G. McGIBBON AND E. T. BAKER-BATES: VALUE OF DIRECT BRONCHOSCOPIC INVESTIGATION IN HAEMOPTYSIS WITHOUT PHYSICAL OR RADIOLOGICAL MANIFESTATIONS

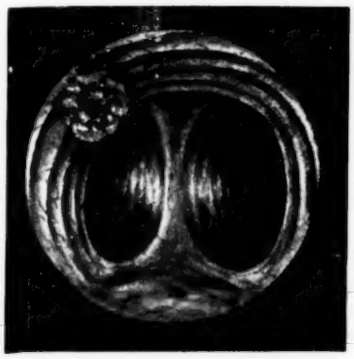

FIG. 1.—Case I. Varix of trachea.

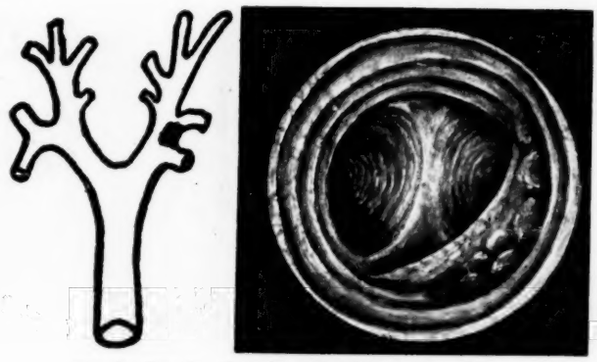

FIG. 2.—Case II. Granuloma of right main bronchus.

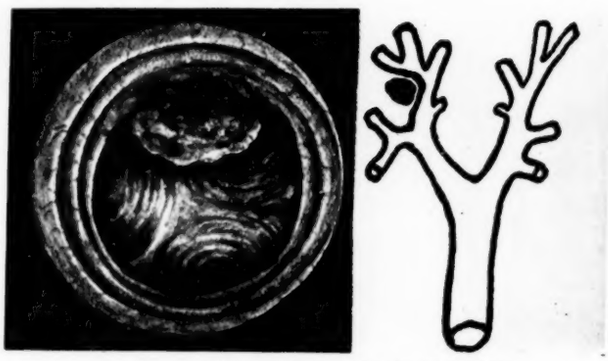

FIG. 3.—Case III. Fibroma of left lower bronchus.

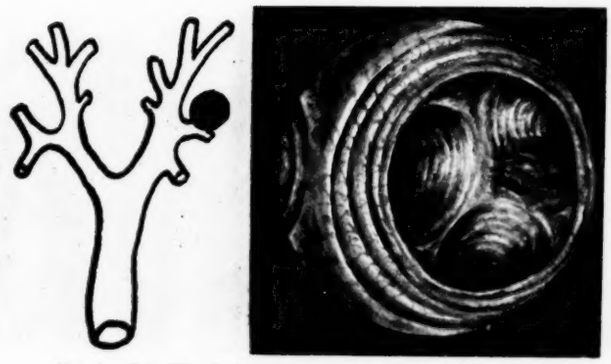

FIG. 4.—Case IV. Malignant neoplasm of right middle lobe bronchus.

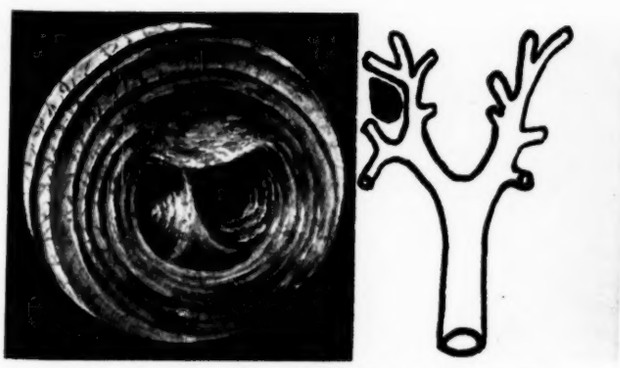

FIG. 5.—Case V. Malignant neoplasm of left lower bronchus.

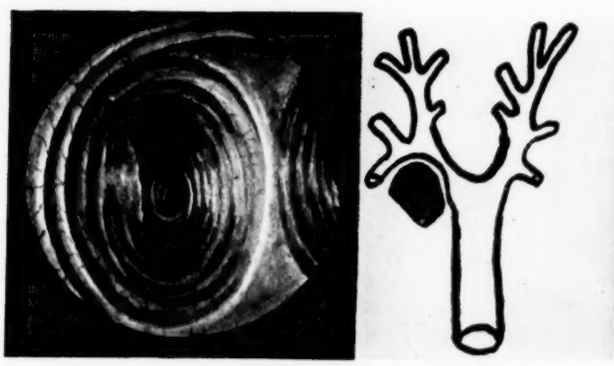

FIG. 6.—Case VI. Malignant neoplasm of left main bronchus.

JOHN E. G. McGIBBON AND E. T. BAKER-BATES: VALUE OF DIRECT BRONCHOSCOPIC INVESTIGATION IN HAEMOPTYSIS WITHOUT PHYSICAL OR RADIOLOGICAL MANIFESTATIONS

FIG. 7.—Case V. Showing *normal* bronchogram of a patient with carcinoma of left lower bronchus.

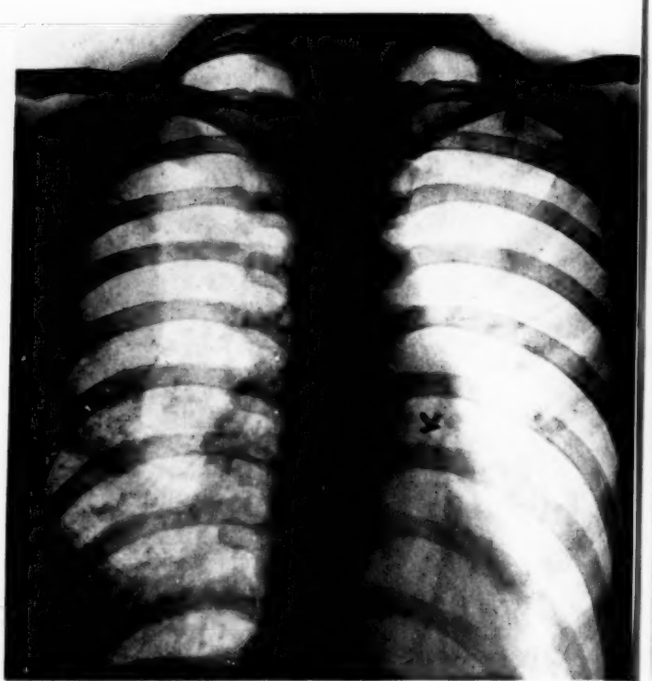

FIG. 8.—Case VI. Shadows of radon seeds indicate the situation of carcinoma in left main bronchus, which was not shown by direct or contrast *x*-ray examination.

J. W. TUDOR THOMAS: RESULTS OF CORNEAL TRANSPLANTATION

FIG. 1.—Case I, aged 52. Right eye before operation.

FIG. 2.—Case I. Two months after corneal transplantation; still clear after seven months, and vision 6/12 (6/9 partly).

FIG. 3.—Case II, aged 23. Left eye before operation.

FIG. 4.—Case II. Nineteen days after corneal transplantation; still clear after nineteen months.

FIG. 5.—Case III, aged 41. Post-mortem photograph of transparent corneal graft twenty-one days after operation; original corneal opacity due to ammonia burns; death took place unexpectedly from carcinoma of stomach.

FIG. 6.—Case IV, aged 57. Post-mortem photograph six months after corneal transplantation; the irregular pupil, due to pre-existing iritis, can be seen through the graft; original corneal opacity due to corneal ulcers.

FIG. 7.—Case V, aged 45. Eleven months after corneal transplantation; still clear after seventeen months; original corneal opacity due to ulceration after measles.

ALECK BOURNE, L. T. BOND, AND K. A. McGARRITY: NEW TREATMENT FOR CHRONIC LEUCORRHOEA

FIG. 1.—Low power. Four hours after treatment. Three zones; the inner showing fixation by zinc chloride, the middle of coagulation necrosis, and the outer of early leucocytic infiltration.

FIG. 2.—High power. Four hours after treatment. Thrombosis of blood vessels in area affected by zinc chloride and preservation of histological structure.

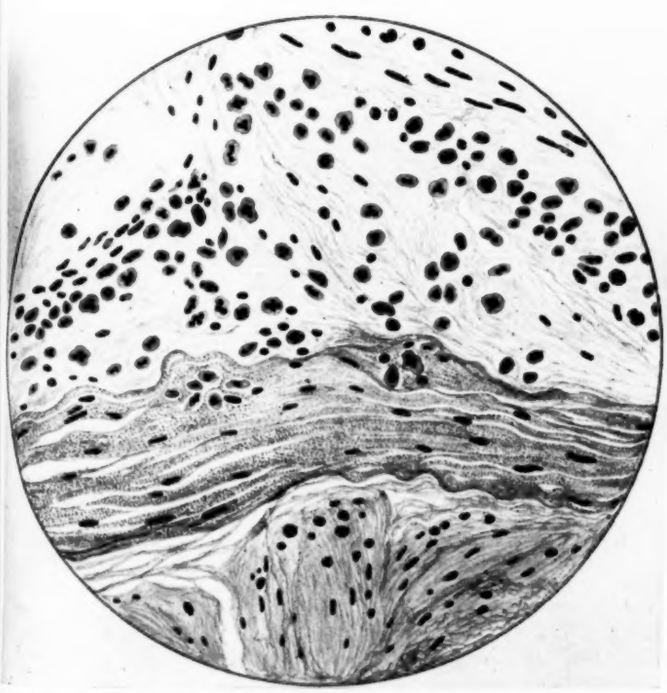

FIG. 3.—High power. Five hours after treatment. Zone of coagulation necrosis and early leucocytic infiltration round the periphery.

FIG. 4.—Low power. One week after treatment. Area of dense cellular infiltration at the periphery, not penetrating the zone of coagulation necrosis, which is the line of future separation of the slough.

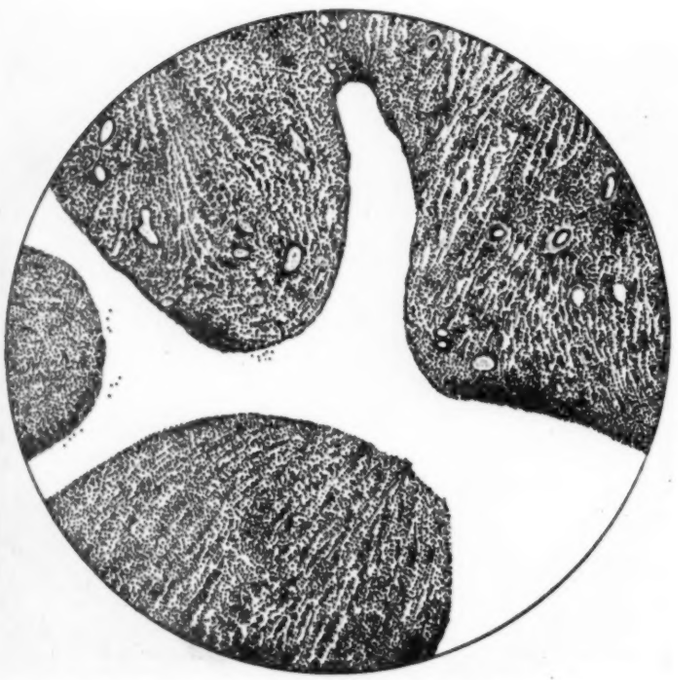

FIG. 5.—Low power. Ten days after treatment. Granulation tissue lining the cervical canal after separation of the slough, and before growth of the new epithelium.

FIG. 6.—High power. Two weeks after treatment. Squamous type of epithelium growing out over surface from columnar epithelium of remaining glands.

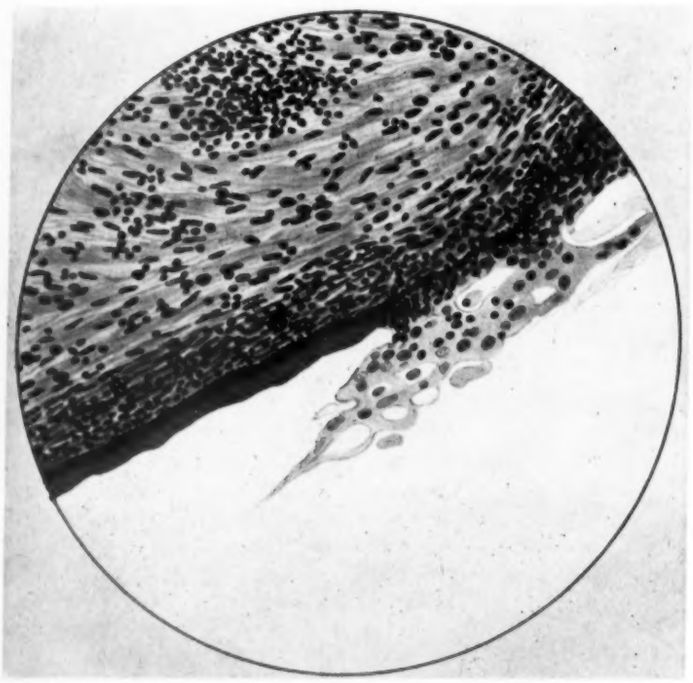

FIG. 7.—High power. Four weeks after treatment. Shedding of superficial layers of squamous epithelium lining the canal to leave the basal layer as the new columnar epithelial lining.

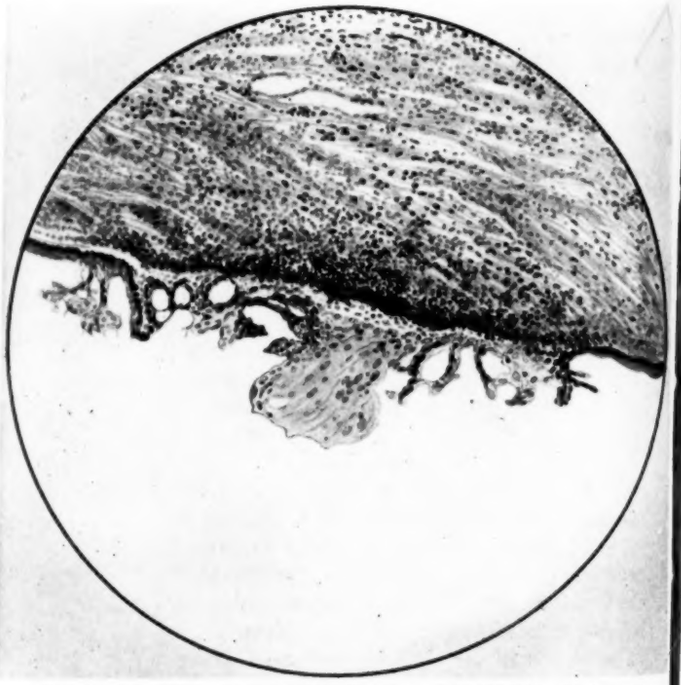

FIG. 8.—Low power. Six weeks after treatment. Tree-like folds of columnar epithelium lining the canal and shedding of the last remnants of squamous epithelium.

CONGENITAL PORPHYRINURIA

Among posthumous papers few can have had more interest than one which now appears[1] from the pen of the late Sir Archibald Garrod. It was evidently given the subtitle of "A Postscript" by the author himself, for the reason that it supplements the accounts published ten years ago of three cases of congenital porphyrinuria. Each of these cases, which were those of Garrod and Mackey, Gray, and Ashby, had shown the three cardinal signs of this rare disease—namely, a port-wine coloration of the urine, blistering of the skin on exposure to sunlight (hydroa vacciniforme), and pink or brown coloration of the teeth, with the exception that the last of these signs was lacking in one case. Full subsequent histories and an account of their present condition had been obtained by Garrod for each patient; all were living, and aged 14, 19, and 30 years. The coloration of the urine had persisted unchanged, and in spite of every precaution blistering of exposed areas of skin had led ultimately to severe scarring, and in one of the patients an eye had been similarly affected. In two the general health has been good, although in one of them there was well-marked enlargement (which has since subsided) of the liver and spleen: the third and oldest of the patients has now a fairly severe degree of anaemia with enlarged spleen. In none of these three patients is there any family history of the disease; the parents of one were first cousins, and apparently none of them is married. It is much to be hoped that the interest awakened in others by the late distinguished author of this paper in this disease, and especially in these patients, will not be allowed to lapse.

POST-OPERATIVE LUNG COMPLICATIONS

Pierre Duval and Léon Binet[2] have published experimental work to explain the pathogenesis of the group of post-operative pulmonary complications not associated with well-known causes: inhalation anaesthesia, venous emboli, or dissemination from a septic focus. They refer to those which follow operations correctly and aseptically performed in a non-septic field under local anaesthesia. The work was carried out in an attempt to confirm the idea that the cause of these complications might be the intoxication which follows all surgical interventions from the autogenous albumins (polypeptides which do not cause shock) produced by the operative trauma and disseminated by the blood stream. Polypeptides prepared from the muscles of dogs were injected into either the saphenous or the mesenteric veins of other dogs. To avoid confusion with lesions that might be produced during death the animals were killed while under basal anaesthesia by bleeding them fifteen minutes after the intravenous injection, and the lungs were examined by performing a thoracotomy before death. Controls treated in this way showed no lesions. The injections were given to normal animals and to those which had previously been sensitized by a subcutaneous injection of polypeptides. No lesions were observed in the non-sensitized. On the other hand, in the sensitized animals foci in the lungs were found consisting of dark red zones on the light pink background of the rest of the organ. On section they showed all the macroscopic characters of red infarcts. Histological examination revealed two types of morbid change: (1) typical atelectasis with dilated vessels, and (2) alveoli distended with blood (*apoplexie pulmonaire*). These changes correspond to those found in man. Finally the authors quote a case which appears to confirm their laboratory results. A man died four days after a simple exploratory laparotomy under local anaesthesia with symptoms of lung involvement. The histological changes in the lungs were similar to those found in the experiments. Moreover, two days before death the blood contained 80 mg. polypeptides per 100 c.cm.—nearly three times the normal figure—and 2 grammes of urea.

[1] *Quart. J. Med.*, 1936, **5**, 473.
[2] *Presse méd.*, 1936, **92**, 1800.

RATIONAL PRESCRIBING

The cost of drugs is a serious item in all hospital budgets, and examination of these costs usually reveals a wholly disproportionate expenditure on flavouring agents and on expensive proprietary drugs for which official equivalents are available. The London County Council has endeavoured to lower these unnecessary costs by issuing an *L.C.C. Pharmacopoeia* for use in its general and special hospitals.[1] This is a pocket volume of 279 pages, most of which is occupied by a list of drugs and formulae. This list contains about 1,500 titles and comprises all the pharmaceutical preparations in the *British Pharmacopoeia*, selected preparations from the *British Pharmaceutical Codex*, and a number of special formulae. The latter have been compiled with a rational regard for simplicity combined with efficacy, and errors such as redundancy in flavouring agents have been avoided. For example, iron and ammonium citrate mixture contains an effective dose of the iron salt (30 grains) and water to 1 fluid ounce. This is in pleasing contrast to the familiar prescriptions which so often combine an insufficient dose of iron with a large array of expensive flavouring agents. The last quarter of the book provides a variety of data and information. Useful features that deserve special mention are instructions on methods of administering drugs, on the collection and forwarding of material for chemical investigation, and on such clinical procedures as the giving of test meals. Clear directions of this kind should do much to reduce waste of time and labour in clinical laboratories. The only criticism that occurs to us is that the list of drugs and formulae is unduly long and it certainly contains some substances of very doubtful efficacy; but experience gained from the use of the *L.C.C. Pharmacopoeia* will probably lead to a good deal of pruning for subsequent editions. Sir Frederick Menzies in an introduction claims that this pharmacopoeia is probably the most comprehensive and up-to-date of its kind. The volume is offered for sale to the profession at the very low price of 1s. 6d. It deserves wide popularity, not only for the mass of useful information it contains, but also because it is based on rational conceptions of therapeutics.

[1] *London County Council Pharmacopoeia.* P. S. King and Son. (1s. 6d.)

ENDOCRINES IN THEORY AND PRACTICE

This article is one of a series on Endocrinology contributed by invitation

CRETINISM AND MYXOEDEMA

BY

H. GARDINER-HILL, M.D., F.R.C.P.

Hypothyroidism occurs in two main forms—cretinism in children, myxoedema in adults. Both conditions are due to simple insufficiency of the thyroid gland.

Only the sporadic form of cretinism will be discussed in this article as the endemic variety is not a result of simple thyroid deficiency. Its aetiology is intimately associated with endemic goitre, and it occurs in the later generations of families suffering from endemic goitre. The pathogenesis of endemic cretinism cannot be regarded as one of simple hypothyroidism. Sporadic cretinism is found in regions where goitre is not endemic and bears little relation to the endemic variety. It is said that heredity is seldom a factor, and this is certainly true in my experience. The picture is typical of simple athyroidism. This may be attributable occasionally to thyroid maldevelopment but usually to atrophic changes in the foetal gland resulting from acute thyroiditis, probably the sequel of infective disease in the mother during pregnancy.

Myxoedema is the syndrome of thyroid deficiency in the adult. There may be an antecedent history of hyperthyroidism, the result of emotional stress or some septic process which has caused an exhaustion atrophy of the gland. Other cases result from too great a removal of thyroid tissue by thyroidectomy. Myxoedema may also develop as an end-result of repeated pregnancies or may appear with the termination of ovarian activity at the climacteric. Williamson and Pearse have suggested that myxoedema is the end-result of lymphadenoid goitre. There may be very little thyroid enlargement, but a marked fibrosis of the gland occurs. They, in conjunction with McCarrison, are of the opinion that the condition results from a faulty diet, especially deficient in vitamin A rather than in iodine.

Clinical Picture of Cretinism

The clinical features of cretinism are striking disturbance of growth, mental retardation, and delay in sex development. The characteristic growth disturbance is a disproportionate dwarfism, the limb measurements being unduly short when compared with the trunk. This is associated with retardation of bone development, especially in the long bones, and a delay in the appearance of the centres of ossification. Mental retardation is an invariable accompaniment of cretinism. The reaction of the child to stimuli is peculiarly slow and characteristic. If untreated, the mental state is seriously impaired. Mental processes become slower and slower, and, in severe cases, imbecility results. High-grade cretins may, in fact, be devoid of response to the ordinary mental and physical stimuli and lie about in a state of imbecilic apathy. Retardation of sex development in untreated cretinism is also pronounced. Puberty may be indefinitely delayed and the secondary sex characters fail altogether to appear.

Though the main clinical features of cretinism are physical and mental backwardness, other symptoms develop which produce a striking clinical picture. The facies of the cretin child is coarse and puffy, the complexion becomes pasty and sallow, the hair dry, and the tongue broad, large, and thick. The extremities are cold and cyanosed and the temperature consistently subnormal. Myxoedematous deposits appear above the clavicles, making the neck appear short and thick. The fingers tend to be broad and square at the tips and the skin is dry.

Myxoedema

The clinical picture of myxoedema in adults is in many ways similar, although the onset of hypothyroidism in the fully developed individual cannot be accompanied by disturbance in growth. Regressive changes in the genital organs are nearly always present. It must be remembered that myxoedema is a protean disease, extremely insidious in its onset, and may present itself under various guises. Mental changes are frequently the earliest symptoms. It is not at all uncommon to find that the patient fails to recognize any deterioration in health. This is no doubt partly due to the slowing-up of all mental processes which is such a striking feature of the condition.

To illustrate this, of the first 101 cases of myxoedema I saw, in fifty the thyroid condition was recognized by the doctor only during the course of some intercurrent illness. The individuals had not previously complained of ill-health. In the other fifty-one cases the patients sought medical advice for symptoms which were attributable to hypothyroidism. Nineteen complained of general swelling of the body, face, hands, and feet; seventeen observed loss of power and sensory disturbances—pins-and-needles and numbness of the limbs; eighteen mentioned as one of their first symptoms lethargy, weakness, and undue fatigability. Other symptoms complained of were menorrhagia and floodings, subjective feelings of cold, alterations in voice and speech, loss of hair, and loss of memory. Some patients with myxoedema may seek medical advice for obesity, sterility, repeated miscarriages and stillbirths, or chronic rheumatism.

The clinical picture of fully developed myxoedema is characteristic. The skin is dry, the eyelids puffy, myxoedematous deposits occur in the subcutaneous tissues, and the hair becomes extremely dry and brittle and is often shed not only from the head but from the eyebrows. The movements become clumsy, speech is slow and characteristically indistinct, the temperature is subnormal, and intense subjective feelings of cold are complained of.

In both cretinism and myxoedema certain abnormalities occur in the metabolic sphere. The basal metabolism is reduced to an extent found in scarcely any other pathological condition. Levels of 40 per cent. to 50 per cent. below the normal limits are usual. Investigations of the basal metabolic rate are of great value as a means of confirming the clinical diagnosis.

Diagnosis

The clinical picture of both cretinism and myxoedema in their fully developed forms is so typical that small difficulty is likely to be experienced in diagnosis at this stage. In early and mild cases, however, the problem is less easy, though, if the characteristic clinical features are borne in mind, suspicions of thyroid deficiency should

be aroused. The various guises under which adult myxoedema can present itself must be remembered, for it will be found that such cases often come to the gynaecological or other special department with symptoms indicative of local disease.

If confirmatory evidence of thyroid deficiency is required a basal metabolic rate test can be carried out. This test in thyroid disease corresponds in value to the blood count in anaemia. If it is below the normal level, with clinical symptoms of hypothyroidism, the diagnosis is assured. In the very young the performance and interpretation of the basal metabolic rate test is difficult. In juveniles and adolescents it can be carried out without difficulty. In young children valuable confirmatory evidence of hypothyroidism can be obtained from radiological examination of the carpus, for the ossification centres are late in appearing and typical delay will be found.

Course and Prognosis

The results of treatment of cretinism and myxoedema are on the whole satisfactory.

In cretinism much depends on an early diagnosis and the institution of thyroid therapy at the earliest possible stage. The results of thyroid therapy on the growth defect in cretinism are most satisfactory, provided that treatment is begun early. Under these conditions the physical standards reached compare favourably with the normal. It is more difficult to assess the possibilities of improvement in the mental sphere. If treatment is begun late mental development may remain much below the normal, and the years lost before treatment is instituted may never be regained. It is probably true to say that the improvement in mental development is seldom as great as in the physical sphere, although examples could be quoted in which standards above average have been attained. The defects in sex development can be corrected by thyroid therapy, and with successful treatment the changes of puberty will occur at the normal age or very shortly afterwards. In females the menstrual cycle can usually be satisfactorily established.

The prognosis in adult myxoedema is good and the clinical results of thyroid treatment are most satisfactory. In the course of about six weeks it can be predicted that the myxoedematous changes will have entirely disappeared and the patient be restored to his or her former condition.

In both cretinism and myxoedema it is essential that the patient should continue treatment throughout life.

Treatment

The therapeutic indications in the treatment of cretinism and myxoedema are clear. The basal metabolism of the patient must be brought to the normal level and there maintained by an appropriate daily dose of thyroid extract given by the mouth. In practice it is not always possible to have estimations of the basal metabolic rate carried out, and in the ordinary straightforward case it is certainly not necessary. An initial estimation, however, will be of considerable value and will give a good idea of the amount of thyroid extract which is likely to be required. To a large extent the basal metabolic rate runs parallel with the pulse rate, so for ordinary purposes the latter will usually be a sufficient guide, especially if it is used in conjunction with clinical data, particularly variations in the patient's weight.

Most cases of cretinism and myxoedema are extremely sensitive to thyroid extract, so it is best to begin with a small daily dose and gradually increase it at intervals of a week or so until the appropriate maintenance dose has been found. This fractional method of introducing thyroid treatment gives good results and avoids any risk of overdosage in the early stages. The problem of dosage is almost identical in childhood and adult hypothyroidism. The usual method is to start with 1/4 grain of a desiccated extract once a day, increasing to 1/4 grain twice a day at the end of a week, 1/2 grain twice a day at the end of another week, and later to a total of 1½ or 2 grains daily. For a cretin a sufficient maintenance dose of thyroid extract is usually 1 to 1½ grains a day, but the dosage varies to some extent with the age of the individual. The maintenance dose for a fully developed case of myxoedema is usually about 1½ to 2 grains a day of a desiccated thyroid extract. A larger dose is seldom necessary. It must be pointed out, however, that it is only possible to judge by results, and no hard-and-fast rules can be laid down. Adult patients often rapidly acquire a knowledge of what is the optimum dose for them and can give considerable help to the physician. They should be warned at the start that treatment will have to be continued throughout life and that successful results depend to a large extent on the systematic supply of thyroid extract in the correct dosage. Since the effects of the remedy are so obviously beneficial there is seldom any difficulty in obtaining complete co-operation from the patient.

This slow method of introducing thyroid treatment is suitable for ambulatory cases. If quicker results are required the patient should be put to bed, and in these circumstances the increases in dosage can be made at shorter intervals. The usual method when the patient is in bed is to make 1/4 grain increases every other day until the full maintenance dose has been reached.

Overdose of Thyroid Extract

A warning is necessary as to symptoms of overdosage and thyrotoxaemia, and I would draw a distinction between the two. The ill effects of the former usually pass off quickly on withdrawal of thyroid, but the effects of thyrotoxaemia are more lasting. When this complication has occurred, in my experience it has usually been due to the presence of a septic focus or to taking thyroid extract during an infective illness such as influenza or tonsillitis. This usually results in a persistent tachycardia with other signs of cardiovascular disturbance, and the individual loses weight as he does when suffering from thyrotoxaemia of other forms. In view of the possibility of this complication arising it is therefore a good rule, when instituting thyroid treatment, first to make sure that all septic foci have been dealt with, and secondly, to warn the patient to discontinue treatment if any such eventuality arises. The risk of overdosage can best be overcome by stopping the routine administration of thyroid for a day or two each week or for a few days each month to obviate any cumulative effects. If overdosage does occur all thyroid should be stopped for a week or two and started again at half the previous dose. It is not difficult to detect overdosage at an early stage, as, when myxoedematous symptoms have once been controlled, the weight should remain more or less constant at approximately the normal level. Any tendency to lose weight below the average normal, especially if there is tachycardia and undue nervousness, should be regarded with suspicion.

A note is perhaps necessary as to the different preparations of thyroid extract in general use, though only two require serious consideration—the fresh gland, and desiccated or dried gland extracts. The latter are five times

the strength of the former. It would generally be agreed that the desiccated extracts are more reliable and more stable, and now that they are available it would seem better to use them in all cases. Synthetic thyroxine, which has recently been introduced, appears to possess no advantages over the dried gland preparations—in fact, the majority of clinicians would probably agree that it is of distinctly less value.

In conclusion, it cannot be emphasized too strongly that to obtain good results in the treatment of hypothyroidism a standardized and reliable preparation of thyroid extract should always be used.

PHYSICAL EDUCATION IN SCHOOLS

LONDON CONFERENCE

One of the series of educational conferences at University College, London, held on January 8, was arranged by the Medical Officers of Schools Association, when the subject of the education of the body in public, secondary, and preparatory schools was discussed.

Dr. E. KAYE LE FLEMING, chairman of the Physical Education Committee of the British Medical Association, addressed the conference. He discussed first the bearing of nutrition on physical education. In the schools under consideration the possibility of any total insufficiency of food might be dismissed, but the best-calculated diet sheet in public schools failed to disclose quality and the style of cooking and serving. He was sorry to learn that in many schools fresh fruit was an "extra" to be paid for. The spacing of meals was an important matter. He knew of a large public school where nothing was provided between the midday meal and 6 o'clock in the evening, although not only school lessons but active games had been taken. A great deal of unhealthy overcrowding still existed in school dormitories, an important factor in school epidemics. He also touched on the matter of clothing, advocating a minimum, but differentiating sharply between this and nudism.

The body, Dr. Le Fleming continued, was a machine controlled by the will and capable of almost an infinite variety of development. The contortionist, the skater, the first-class golfer, the typist, were all examples of special development of muscular facility, but that was not the object of the development of the body, as he saw it, in the schools. Any specialized development of the human body could best be brought about on the basis of a sound development of the whole system—to quote the report of the B.M.A. Committee, "An educated body is a balanced body." Poise or balance and the grace associated with it might be excellently studied in the playing of games by experts, especially as recorded by the slow-motion film.

Body Development

He proceeded to speak of three practical examples of body development which had come home to him with great force. At the outbreak of war in 1914 some of the finest young men in the country were among the first recruits. Dr. Le Fleming thought particularly of a number who went to a camp in the South of England, living for a time in the open, and later under canvas, with abundance of simple food and exercise. Fit as they were to begin with, these men actually grew out of their clothes before uniform was provided for them, so quickly did they respond to this open-air environment, but immediately they went into billets in December large numbers of them went on the sick list, a result of the change from an outdoor to an indoor life. His second example was from the Military Tournament at Olympia last year, where he had been particularly struck by the display given by eighty men of the Royal Air Force. He was told that they had all been taken out of the distressed areas the previous January, which made him remark to his hosts of the Air Force that he wished he could have the lot to take on tour round the schools of the country to show what physical education could do in a short time. Recently the question of Army recruiting had come forward. The work of the Army in physical education had been most carefully and scientifically carried out for many years, and although the dearth of A1 recruits had been so marked that second-class material had to be taken, the results with this material, thanks to the system employed, had been amazing.

The first problem in connexion with the schools was to get the conception of the value of physical education into the minds of the head masters. There were notable exceptions, but, on the whole, head masters were not yet sufficiently convinced. *Quis custodiet ipsos custodes?* Dr. Le Fleming was alive to the difficulty in schools of determining the relation between physical education and games. In the B.M.A. Committee report it was pointed out that education and games were all part of the same thing. Physical education was part of the preliminary training for games, which were themselves specialized products of physical education. Physical education in schools could be made interesting by being linked to games, and brought under the control of the one master. It was commonly said that there was no time for physical education. But if its proper value were acknowledged time would be found for it. The reason why time was not found was because it was not considered so important as academic subjects.

Need for Trained Instructors

Finally there was the problem of finding the teachers for the teaching of physical education on modern lines. While aware of the Carnegie Physical Training College at Leeds and one or two other institutions, he felt that there was a great dearth of centres so far as men were concerned; women had more facilities. If physical education was to be properly developed it required also the close co-operation of educationalist and doctor. Physical education was itself a most important part of preventive medicine, but it had not yet emerged on to the scientific field. Science was measurement, and as yet the measurements of physical fitness had not been worked out. There were no accepted scientific medical standards for physical fitness at all. Every doctor, for example, had his own method of testing normal heart tolerance to exercise. Even in the Services there was no uniform system of testing heart tolerance. There ought to be some centre where the problems could be studied scientifically. The universities were the obvious resource, but at present those concerned with this subject found little encouragement in academic quarters.

General Discussion

In some further discussion Dr. C. W. ROE (St. Paul's School) advocated a six-months course of physical and educational training for all boys between 15 and 19. They could take this course at any convenient time during that period, they should be boarded in hostels or other suitable buildings at the expense of the State, and should be graded according to physique and mentality. Dr. A. H. MACDONALD (chief medical officer of Dr. Barnardo's Homes) said that only 1 per cent. of the new admissions to the Homes were physically A1, but owing to the combination of nutrition and physical exercise 30 per cent. of the boys when they left the Homes were in that category. Dr. L. R. LEMPRIERE (Haileybury) contested Dr. Le Fleming's assumption that crowded dormitories were the cause of school epidemics. He thought the spread of infection more likely in classroom and common room.

Dr. E. H. T. NASH, in discussing the readjustment of the school curriculum to admit of a greater place for physical education, expressed the view that from the standpoint of fatigue a number of the academic periods were unduly long; if these were shortened the necessary periods for physical education could be worked in. He

also pointed to one of the weaknesses in the physical educational system in that, while every other specialist master in the academic field could reasonably aspire to a headship, the physical instructor could not do so, and thus recruiting in this branch of the teaching profession lacked encouragement. Dr. ATTLEE raised the question whether there was any danger of getting people so thoroughly fit that they failed to adapt themselves to modern conditions. Dr. MORLEY drew attention to a possible fallacy in recruiting statistics on which wrongful impressions as to national decadence might be based. A wholly wrong idea as to the physical fitness of the male population of the country at the time of the war was derived from the recruiting statistics showing a large percentage of rejections. The fact was that the rejected men were summoned before the medical boards time after time, and as the war went on the standard of acceptance was lowered, with the result that the man who had at first been put in a low category was placed higher and higher, and at last perhaps passed for active service. But in the returns this man might account for half a dozen units in the total of unfitness, whereas the fit man was only counted once.

Dr. LE FLEMING, while acknowledging inevitable overcrowding in the classrooms, was still of opinion that the real trouble and the remedy lay in the dormitory. With regard to recruiting, in view of the fact that the record of the types of men who sought to enlist in the Army showed a steady fall, it seemed to him that no other deduction was possible than a lowering of the physical standard of the nation.

THE RED CROSS IN SPAIN

A memorandum from the International Red Cross Committee at Geneva states that thirty-five national Red Cross societies (including the British Red Cross Society) have now contributed to the relief of the sufferers in the Spanish civil war, their donations amounting to 459,398.48 Swiss francs, of which over 330,000 has come from South America. All these gifts are made unconditionally and without distinction, and are administered by the International Committee with its traditional impartiality. The sums received have made it possible for medical supplies for the treatment of wounded on both sides to be sent in increasing quantities.

Information bureaux have been established at a number of centres, and over 50,000 queries have already been forwarded to Geneva for solution, and in addition delegates of the International Committee, working with local personnel, are working at Madrid, Valencia, Barcelona, Burgos, Santander, Bilbao, San Sebastian, Alicante, Seville, Saragossa, and Palma de Majorca. Special data are being collected on the subject of orphans, and arrangements are in train for their future care. The committee's delegates have been authorized nearly everywhere to visit the prisons, and agreements have been established whereby the release of women, children, boys under 18, adults over 60, and invalids has been secured. The delegates have encountered a promising spirit of co-operation on both sides, but a good many difficulties arise in carrying out the letter of the agreements. Efforts have been made to secure the establishment of a neutralized zone in Madrid as a refuge for the non-combatant inhabitants.

A most serious problem faces those concerned with the relief of suffering in Spain—that of revictualling. Certain commodities, such as coal, are already scarce; rationing and food cards are being instituted, and the question whether the Red Cross can undertake the supply of a minimum of the necessities of life at least, to certain categories of the population—women, children, invalids, and prisoners—is under consideration. The sums required would far exceed those received up to the present, and so far the most that can be attempted is the supply of a few parcels of food and condensed milk to sick prisoners.

Donations to the Red Cross Spanish Relief Fund may be sent to the Director-General, British Red Cross Society, 14, Grosvenor Crescent, London, S.W.1.

AN INFLUENZA EPIDEMIC IN THE FALKLAND ISLANDS

BY

R. L. CHEVERTON, M.R.C.S., L.R.C.P.

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An epidemic of influenza which broke out in the Falkland Islands during the winter of 1935 is of interest from several points of view as showing: first, the effect of limited communications in an isolated group of islands upon the spread of disease; secondly, a peculiar latent period between the primary cases and the general outbreak of infection; thirdly, a well-defined period of incubation; and lastly, the influence of sudden climatic changes, chiefly a change of wind to the south with its concomitant weather, upon the outbreak of the disease.

Geographical Situation and Climate

For better understanding of the spread of the epidemic some knowledge of the Falkland Islands is necessary. They lie in the South Atlantic Ocean about 300 miles to the east and somewhat to the north of Magellanes in the Straits of Magellan, between latitudes 51 and 53 degrees south and longitudes 57 and 62 degrees west. In addition to the two main islands, which are known as East Falkland and West Falkland and are separated by the Falkland Sound, there are about two hundred smaller islands clustered about within a space of 120 by 60 miles. The total area of the Islands is 4,618 square miles. The entire country is of a wild, hilly, moorland nature. The soil is chiefly peat or clay, with areas of sandy outcrops. Trees are absent, and the general appearance of the country is bleak and inhospitable.

The mean average temperature is about 36° F., with a mean maximum of about 46° and a mean minimum of about 34°. The average rainfall is only twenty-six inches, but the air is very damp. During the summer months the constant high winds become very trying, and in winter, which lasts about eight months, the lack of sunshine has obvious deleterious effects. The inhabitants of the place, totalling 2,432, are of European stock, many being of Scottish descent due to the importation of shepherds from Scotland. Owing to the lack of communications, both within the Islands and with the outside world, and to the distance from the Home Country, intermarriage, with its accompanying results, is very common.

As there are no roads outside the town the only means of communication overland is on horseback. All the farmsteads, or settlements as they are called locally, are situated on the seaboard, and small steamers or cutters call every few months to bring out mails and supplies or to pick up wool. As in all isolated communities, infectious diseases spread very rapidly so far as lines of communication will permit.

The chief, and in fact the only, industry of the Islands is sheep farming, so there is only one small town—Stanley, the seat of government—which is situated in the East Falklands. The principal local trading company owns a vessel—the s.s. *Lafonia*—which calls at Monte Video for mails and at Magellanes for timber and coal. Four times a year a cargo boat, whose last port of call is Bahia Blanca in the Argentine, calls at Stanley.

Source of the Epidemic

It is thought that the epidemic in question was brought from the coast in the following manner. While crossing to Magellanes in August, 1935, one of the crew of the s.s. *Lafonia* had a cough; in Magellanes he visited a relative's house, in which certain persons were suffering from "la grippe." On subsequent inquiry from the British consuls this disease was found to be very prevalent in Magellanes and, to a lesser extent, at Bahia Blanca between the middle of July and the middle of September,

the mid-winter season of the Southern Hemisphere. The outbreak on the mainland, like that in the Falklands, was of a very mild type. The only contact with Bahia Blanca during this period was through a cargo boat that arrived from there in Stanley on August 21; no cases of influenza, however, were observed among the townsfolk after this visit.

On August 28 the S.S. *Lafonia* arrived back in Stanley, having called at eleven stations on the East and West Falklands since leaving Magellanes on August 21. No cases of influenza were reported from these places, where the actual contact with the *Lafonia* was limited to unloading and loading cargo on very exposed jetties. During the ship's stay in port on this occasion two of her crew were detained in Stanley with acute bronchitis, pyrexia, and joint pains. On August 30 the *Lafonia* left Stanley and proceeded to West Falkland. On September 5, three days after she had touched at a port on that island, an epidemic of influenza broke out and spread to each place visited by the mail officer from the ship. On the same date a definite epidemic of influenza—of the bronchial-catarrhal type and short in duration—broke out in Stanley: the whole town was affected.

It is interesting to note the long latent period between leaving Magellanes on August 21 and the outbreaks on the East and West Falklands on September 5. During this time, although the S.S. *Lafonia* visited numerous ports before reaching Stanley, no cases of sickness were reported except those of the two members of the crew who were detained in Stanley on August 29. This is probably due to the brief contacts made and the conditions of unloading at each port, and to the fact that the two men who later reported sick were neither of them deck-hands; the deck-hands themselves all seemed to be fit except for slight colds, which are very prevalent at that time of year. When these men reported sick they had been feeling ill for several days. They were detained in Stanley, but they obviously left the virus behind with the crew of the *Lafonia* as well as bringing it on shore. The virus in both places remained dormant until the weather conditions of September 3 precipitated an epidemic in Stanley and in the West Falklands. In view of the fact that during the epidemic the period of incubation was established at forty-eight hours, this curious latent period is difficult to understand.

Mode of Spread

It was observed and established that forty-eight hours after the time of contact the victim suddenly went down with excessive joint pains, with marked increase in the pulse rate and a high temperature, the average being 102° F. The onset was followed by an acute bronchitis with rather a dry cough; after three to five days the condition cleared up, leaving the patient with a feeling of lassitude which lasted for some time. Old people suffered most. There were three cases of bronchopneumonia, and several patients had persistent tachycardia, at least one of them dying as a result of working too soon after recovery from influenza.

On the East Falklands the disease spread wherever contact with Stanley was made. It was possible to warn certain settlements by telephone of the outbreak in Stanley, and some managed to isolate themselves satisfactorily; but during the first twenty-four hours of the epidemic some farm-hands left the town and carried the disease with them to the houses and settlements that they visited. The progress of the disease could be quite definitely traced as these men spread about the island and as contact was made with the houses which they had visited. For instance, one of the members of a household visited by a labourer returning from Stanley came into his settlement for a dance which was being held there. A man from a neighbouring settlement was also present. The day after the dance the first man developed influenza, and it was soon raging round the settlement; a couple of days after the dance the visitor from the other settlement also developed influenza and spread it around his settlement, where all but five persons were affected.

When other managers heard how infectious the epidemic was they forbade any of their men who were in Stanley at the time to return to their settlements, and refused to allow any persons from infected areas to cross their lands, thus ensuring themselves against loss of working time through sickness. As a result of these precautions the island could be divided into sharply defined areas where the disease was or was not present. On the West Falklands the progress of the disease was much the same, only one or two isolated places escaping. In Stanley the epidemic raged from September 5 until about October 5, with periods of exacerbation which seem to have been influenced by climatic changes. At its height the schools were closed for three weeks.

Meteorological Influences

The epidemic broke out on September 5, and between September 1 and 7 the following meteorological readings were taken. It should be remembered that in the South Atlantic seas it is found that the cold winds come from the south and that the south-east winds are cold and damp.

TABLE I.—*Meteorological Readings from September 1 to September 7*

Date	Barometer, Mean Pressure in Millibars	Maximum Temperature, Fahrenheit, Screen	Minimum Temperature, Fahrenheit Screen	Wind	Rain	Hours of Sunshine	Remarks
Sept. 1...	1012	36	28	S.W. (6)	0.02	4.1	Snow
„ 2...	1007	36	26	S.S.W. (5)	0.04	3.7	Snow
„ 3...	1012	31	21	S.S.E. (6)	0.08	1.9	—
„ 4...	1016	38	20	W.S.W. (5)	0.13	3.2	—
„ 5...	1021.7	42	28	W.S.W. (5)	0.03	5.6	—
„ 6...	1015.1	43	32	W. (5)	0.06	3.7	—
„ 7...	1003.4	36	29	W.S.W. (5)	0.21	2.5	—

On September 19 relapses were common and further outbreaks occurred. The meteorological readings between September 15 and 21 are shown in Table II.

TABLE II.—*Meteorological Readings from September 15 to September 21*

Date	Barometer, Mean Pressure in Millibars	Maximum Temperature, Fahrenheit Screen	Minimum Temperature, Fahrenheit Screen	Wind	Rain	Hours of Sunshine	Remarks
Sept. 15	998	43	31	W. (5)	0.16	5.4	—
„ 16	1003.8	41	27	W.S.W. (5)	0.16	6.5	—
„ 17	1002.3	36	30	S.E. (3)	0.4	0.2	—
„ 18	1010.3	42	23	S. (7)	0.08	2.9	—
„ 19	1000.8	45	31	S.W. (6)	0.07	0.7	Snow
„ 20	994.0	46	35	W.S.W. (5)	0.03	8.3	Snow
„ 21	995.2	46	34	W.N.W. (4)	0.02	8.3	—

Conclusion

During the epidemic it was observed that forty-eight hours was the period of incubation, therefore one would expect the weather two days previous to the outbreaks to be of relevant interest; this is confirmed by a study of Tables I and II. The original outbreak was on September 5, and on September 19 there was a fresh

outbreak and several relapses in Stanley, so September 3 and 17 are the dates chiefly to be noted; points of significance are:

1. Both tables show a drop in the barometer readings forty-eight hours before the outbreaks.

2. Both tables show an appreciable drop in the maximum temperature forty-eight hours before each outbreak, followed twenty-four hours later by a rise which continues until twenty-four hours after the outbreaks.

3. Both tables show a drop in the minimum temperature three days before the outbreaks—that is, on September 2 and 16. In Table I the temperature falls until the actual date of the outbreak—September 5—when it rises sharply. In Table II there is a slight rise in the temperature forty-eight hours before the outbreak, followed by a sharp fall twenty-four hours before and a slightly sharper rise on the actual day of the outbreak—September 19.

4. Both tables show a south-easterly wind forty-eight hours before the outbreaks. This wind has a very bad reputation locally as being cold, penetrating, and damp.

5. Both tables show increased rainfall forty-eight hours before the outbreaks.

6. Both tables show very low recorded sunshine forty-eight hours before the outbreaks.

It is difficult to resist the conclusion that these climatic variations had some influence upon the epidemic, in ending the strange latent period before the outbreaks on the East and West Falklands on September 5, and in leading to the second outbreak in Stanley on September 19.

Reports of Societies

RENAL TUBERCULOSIS

At a meeting of the Section of Surgery of the Royal Academy of Medicine in Ireland on December 18, 1936, with Mr. SETON PRINGLE in the chair, Mr. R. ATKINSON STONEY showed a case of late ulnar paralysis, and a modified internal angular splint which he had devised for certain cases of fracture of the surgical neck of the humerus. He had found it useful in cases where it was difficult to apply traction with a Jones splint.

Mr. T. J. D. LANE read a paper in which he briefly summarized the pathology, aetiology, symptomatology, and diagnostic methods employed in the investigation and treatment of the tuberculous kidney. The association of the disease with tuberculous lesions in other parts of the body was important, and it was pointed out that the leading common symptom, frequency of micturition, very often began suddenly, and, except in cases where the ureter was obstructed, the urine was always turbid. Mr. Lane said that in the early case, before secondary infection has taken place, a freshly passed specimen of urine was characteristic in appearance. The turbidity of the urine was faint white turbidity as if a drop of milk were intimately mixed with a large quantity of water, but when mixed infection had occurred the urine, though a little more turbid, was once more yellow in colour. If the urine in a tuberculous case was yellow it was almost certain that secondary infection was present. An instance was cited showing the ease with which the smegma bacillus may be confused with Koch's organism, and the importance of obtaining a catheter specimen in the female was emphasized. Attention was drawn to the value of the intravenous pyelogram, and the unreliability of the indigo-carmine test. Mention was made of some particular diagnostic difficulties such as the occurrence of renal tuberculosis in early pregnancy and in old men.

Nephrectomy, combined with a prolonged period of general treatment, was advocated in unilateral disease, while conservative treatment was reserved for patients in whom the disease was bilateral.

General Discussion

Mr. SETON PRINGLE said that colic and slight albuminuria should be included as early symptoms, and that frequency of micturition and turbidity of the urine were sometimes absent. He hesitated to catheterize a kidney which he believed to be sound, and he agreed that the indigo-carmine test was often unreliable. He had no doubt that tuberculin was of the greatest possible help if there was no active lesion of the lung. Dr. G. C. DOCKERAY said he had never found tubercle bacilli in urine that did not contain both albumin and pus, though the amount of pus might be quite small. Mr. T. A. BOUCHIER-HAYES mentioned cases in which turbidity of the urine and haematuria had been early signs of renal tuberculosis; pain in the back should also be remembered in this connexion. Mr. J. C. FLOOD asked why it was that tuberculosis was so often confined to one kidney. What was the determining factor in establishing the focus in one kidney, and what was the percentage of people with tuberculosis in one kidney who subsequently developed it in the other?

Mr. A. BUTLER, Dr. CYRIL MURPHY, Mr. M. FALLON, and Dr. R. M. CORBET also took part in the discussion, to which Mr. LANE replied.

THE DEFENCE IN NEGLIGENCE CASES

At a meeting of the West London Medico-Chirurgical Society on January 8, Mr. NEIL SINCLAIR presiding, the subject for discussion was "The Defence in Medical Negligence."

Mr. ERIC PEARCE GOULD, president of the Medical Defence Union, said that it was unfortunately true that actions or threatened actions for medical negligence were on the increase. This was attributable to a combination of causes. One of these was a loosening of the old-time relationship of mutual confidence between doctor and patient. Another was that lay people were acquiring greater knowledge of medical matters. A third was the news value of doctors' peccadilloes; such publication encouraged other people to attack their doctors. The gravity of the position was enhanced by the disposition of juries to award very high damages, and also by recent legislation which had extended the liability for the results of negligence from the doctor himself to his estate after his death.

Actions for negligence fell roughly into four groups: (1) The purely malicious; the allegations being made by a disgruntled patient on no substantial grounds, perhaps to avoid paying his doctor's bill. (2) Cases in which there had, quite frankly, been negligence; in these cases the course of action should be to obtain a settlement on the best possible terms for the doctor at the earliest moment. (3) Cases in which there appeared to the layman to be prima facie evidence of negligence, but in which from the medical point of view there was quite a good defence. If the complainant was reasonable it might be wiser in these cases to make a settlement on suitable terms without allowing the matter to be pursued by legal process, or negligence might be denied from the outset and a defence prepared and the action allowed to proceed. Sometimes when a case had passed from the hands of one doctor to another, between whom there was little co-operation, the second doctor had been accused of negligence, and he had the perfectly good defence that he had taken on a case started by somebody else who had planned the line of treatment. Often the defence society was convinced that there was a perfectly good defence, but was met by the unwillingness of the respondent to go into court, on the ground that the proceedings, even if the verdict was favourable, would attract undesirable publicity.

The fourth group of cases were those in which there had clearly been negligence, but the negligence was not that of the doctor. Until comparatively recently it was accepted by the law and the profession that the doctor primarily in charge of the case was responsible for all that happened. Even the anaesthetist had been supposed to be the servant of the surgeon, but now the anaesthetist was regarded as responsible in his own field. Medical work entailed increasingly the co-operation of a team, and a team suggested a body of persons each of whom was trained and skilled in his own part of the enterprise, so that not only the particular task but the responsibility for it could be delegated to him or her. One of the most common examples which had come into the courts was the leaving in of swabs or instruments after operation. Whereas everyone would agree that no surgeon could be exonerated from seeing that the theatre sister was properly trained in her duties, the surgeon was entitled to rely upon her for her specific performance. In the High Court as yet there had been no case in which the responsibility of the person to whom the surgeon had delegated a particular duty had been upheld; a ruling in the South African courts (Van Wyk *v.* Lewis, 1929) was not, of course, binding in this country. Another example was the burning of the unconscious patient by hot-water bottles on being returned to bed after operation. Everyone would agree that the sister of the ward or the nurse in charge of the patient should be relied on to see that obvious precautions had been taken. To medical men it was distasteful to throw the blame, however deserved, on shoulders weaker than their own, but if these cases went into courts of law it was carrying quixotism a little far to say that though there be a legal defence the medical man must not avail himself of it.

Mr. Gould concluded with some advice. There were pitfalls in medical practice, and care and still more care must be exercised. Doctors should beware of telling a patient how blameworthy they felt; the patient was often quite nice about it at the time, but on reflection, and perhaps after a lawyer had spoken to him, he might take advantage of the admission. The doctor should be careful not to criticize in front of the patient or his friends the treatment which another doctor had provided. And at all costs the medical man should join a medical defence society.

Mr. C. T. LE QUESNE, K.C., said that from a strictly legal point of view the possible defences for a medical man charged with negligence might be summed up under three heads: (1) It is quite true that something wrong was done, but I did not do it." This was the successful defence in the case of Crotch *v.* Miles (*British Medical Journal*, 1930, **1**, 620), concerning a forceps left in the wound. (2) "It was not negligence at all. I did the thing with which I am charged, but I deny absolutely that it was negligent." That case would arise when there was a difference of opinion among medical men as to the correct procedure. When the question lay between a specialist and a general practitioner he imagined that the law might reasonably require one standard of judgement from a general practitioner and a somewhat different one from the specialist. (3) "The thing did happen, and perhaps it ought not to have happened, but I am not responsible and someone else is." The provinces of the surgeon, the anaesthetist, and the trained nurse were all separate though all were associated in the operation, but there would always be borderline cases where it would be difficult to determine the responsibility. He imagined that any court would uphold a surgeon who said, "If I am to perform the operation successfully I must not be bothered with such questions as the whereabouts of the hot-water bottle."

Discussion

In a general discussion Mr. W. MCADAM ECCLES said that at the time when some like himself began surgery they felt themselves to be responsible for everything in the operation theatre; but times had changed, team work had assumed greater importance, and some responsibility must attach to each member of the team. At the same time it had become so much the habit of the old surgeon to assume a general responsibility that he was able to detect instantly any failure to carry out an expected procedure, and for his own part he never left a nursing home without making sure for himself that there was nothing in the bed that was likely to injure the patient. Mr. G. B. WOODD-WALKER referred to charges of negligence concerning fractures, or possible fractures, and the unfortunate results which might follow if an ignorant and disgruntled patient was allowed in the out-patient department to handle the notes and reports of *x*-ray and other examinations relating to his case. Dr. RICHARD PERKINS asked whether the doctor was negligent who, unsuspecting that his patient had suicidal tendencies, left in his room a dozen tablets of, say, medinal, with instructions to take two.

Mr. V. B. GREEN-ARMYTAGE referred to the question of maiming, and mentioned a case in which two deaf-mutes, husband and wife, being intelligent persons and not desiring to transmit their defect, applied that the wife's tubes should be tied. One London hospital refused the application on the ground that their gynaecologist, if he performed the operation, would be guilty of maiming and liable under the law, but another London hospital undertook the case without question. Mr. D. H. KITCHIN (barrister-at-law) said that in assessing the responsibility of the surgeon for the action of the nurse the question was surely whether he had been present to supervise what she did, or could by taking reasonable care have remedied the position. He did not think there had been a "hot-water bottle case" in this country, but there was one in Canada in which the patient got damages against the hospital, not against the surgeon. The PRESIDENT remarked that he himself had been the defendant in a "hot-water bottle case" in which, by the action of the nurse, a small burn was caused on the knee of the patient. But the Lord Chief Justice stopped the case and gave judgement in his favour. Dr. H. H. SANGUINETTI referred to the famous Hadwen trial at Gloucester in 1924, turning on the responsibility of the practitioner for taking a swab in a case of diphtheria as an instance of how uncertain were the duties expected of a practitioner in a given set of circumstances. Dr. HOWARD STRATFORD said that the question of *x*-ray examination was raised not only in cases of suspected fracture but of suspected pulmonary tuberculosis. If a person was examined for suspected tuberculosis and pronounced free and tuberculosis developed later the examining practitioner might have to meet a complaint that he should have added *x* rays to his other methods of examination. Dr. G. SLOT referred to the question of notifying infectious diseases. Many years ago, called in to see a child in a Paddington basement, he suspected diphtheria and signed the case up as such. A month later he received a solicitor's letter demanding £30 damages. It appeared that another doctor had been called in who had said that the case was not diphtheria, but meanwhile, as a result of his notification, the house had been fumigated and the man kept from his work. Dr. Slot referred the matter to the Medical Defence Union, and the demand for £30 was turned into a letter of apology. But the question of infectious disease was really very difficult, and it would be interesting to know how much negligence was concerned if the doctor missed one of the more easily "missable" infections.

The British Association for the Advancement of Science will hold its annual meeting this year at Nottingham from September 1 to 8, under the presidency of Sir Edward Poulton. Among the sectional presidents are Dr. G. W. C. Kaye (mathematical and physical sciences), Dr. F. L. Pyman (chemistry), Professor F. A. E. Crew (zoology), Professor P. Sargant Florence (economics), Dr. J. H. Hutton (anthropology), Dr. E. P. Poulton (physiology), Dr. Mary Collin (psychology), and Mr. H. G. Wells (education).

Local News

INDIA

Calcutta School of Tropical Medicine

The annual report of the Calcutta School of Tropical Medicine for 1935 was drawn up by Brevet-Colonel R. N. Chopra, I.M.S., who succeeded the late Lieut.-Colonel H. W. Acton at the beginning of that year as director. The present report makes special reference to epidemic dropsy and cerebro-spinal meningitis. In the first of these it was shown that cardiac enlargement occurred in about 30 per cent. of cases, and that there was no myocardial degeneration though the heart did not obtain adequate rest. The various stages of the evolution of sarcoids in this disease were defined, and evidence was obtained indicating that the proliferation of the epithelial cells and the formation of new capillaries was probably caused by a toxin. Epidemiological studies seemed to point to infection as the aetiological factor. Doubt is cast upon the so-called mystery disease "jhin-jhinia" being a clinical entity. In the department of pathology, bacteriology, and helminthology investigations have been continued on the cholera bacteriophage. The gross mortalities in two series of cases, in one of which bacteriophage was added to the usual routine treatment, showed that definite benefit followed this addition. The figures in those cases from which agglutinating vibrios were isolated provided even stronger indications, the general impression being that complications such as uraemia might be averted and the general course of the infection be rendered milder. The Mosquito Transmission Inquiry concluded that intensive transmission of malaria was not confined to the monsoon period of three or four months, but was possible all the year round under the conditions prevailing in Calcutta. In the department of pharmacology it was shown that there was no direct relation between the concentration of quinine in the blood and the parasite count at any particular time, and that the action of quinine on the parasite did not appear to be a direct one. The Anaemia and Respiratory Diseases Inquiry showed that the vast majority of anaemias met with in the tea gardens were due to "conditioned" iron deficiency. In all cases investigated there was heavy hookworm infection; the presence of these parasites did not affect regeneration of the blood when sufficient iron was given, although the improvement was not maintained in cases in which the infection persisted. Tetrachlorethylene proved to be a cheap and effective remedy for this infestation. All the papers and memoirs which have been published in the *Indian Journal of Medical Research* and the *Indian Medical Gazette* are reproduced as appendices to this report.

Medical Relief in the Punjab

Colonel C. H. Reinhold, Inspector-General of Civil Hospitals in the Punjab, in his annual report for 1935 maintains that the Punjab leads the rest of India in the distribution of dispensaries on an area and population basis, but adds that the need to-day is a wider appreciation of the extent of tuberculosis, especially in the overcrowded towns. Hill sanatoria only touch the problem, and until the headquarters of each district has a sanatorium in its suburbs the problem will remain. He believes that the tuberculosis unit of each district should be tripartite, embodying a diagnostic dispensary in the town, a hospital for advanced and observation cases on its outskirts, and a sanatorium for curable cases within reasonable distance of the residences of relatives of the patients. This is being effected in Amritsar and Rawalpindi owing to local official efforts and public generosity, while in connexion with the Mayo Hospital, Lahore, a tuberculosis institute has been established. No appreciable progress was made in the year under review in respect of medical aid for women by female practitioners, and purdah women are consequently still suffering from great neglect. Colonel Reinhold insists that it is necessary, therefore, to proceed further with the Government scheme of 1926, which is largely in abeyance owing to financial stringency. This scheme envisaged the establishment of a separate women's hospital at the headquarters of each district under the charge of a woman assistant surgeon. There are at present fifty separate hospitals for women under the charge of medical women, five of which are maintained by the Government, twenty-three by mission authorities, and the remainder by various organizations. The number of women medical students is increasing slowly, and additional facilities are having to be provided for them in some teaching centres. The leprosy survey in the Punjab is proceeding, but the Government considers it impracticable at present to apply to the Province the provisions of the Indian Lepers Act. It has been decided, however, to push forward a scheme for establishing a settlement for "burnt out" cases, to which lepers from the various homes could be transferred, thus making room for the treatment of a greater number of active cases.

ENGLAND AND WALES

The General Infirmary at Leeds

Since the General Infirmary at Leeds was opened for the reception of patients in the year 1869 a good many extensions have been carried out to meet its increasing requirements resulting from the growth in the number of patients treated and from the improved methods of dealing with these. One of the first was the provision of a separate nurses' home in the late 'seventies, very soon found to be inadequate for the increasing staff and having to be enlarged in 1885. An additional nurses' home was built in 1898. Among the greater extensions of the Infirmary will always be associated the names of Mr. R. Benson Jowitt and Mr. Charles Lupton. With that of the former one thinks of the provision of an extra ward pavilion, a new out-patient department, the pathological block, and an isolation department. With that of the latter one must always associate the King Edward memorial extension. This provided another large ward pavilion, new operating theatres, a new out-patient department, an extension of the accommodation for the nurses, and some important structural alterations. But things cannot stand still, and in large hospitals, especially in those forming an essential part of a medical school, there can be no such thing as finality. In 1933, therefore, the foresight of Mr. Lupton, and the enthusiasm of Mr. A. P. Nicholson, the present chairman, led to the launching of a great appeal for £250,000. Yorkshire has responded generously to this, and on the last day of 1936 it was announced that the goal had been reached. Some of the objects for which the appeal has been made are already well in hand, and one of them, inasmuch as it has now been completed, may be briefly referred to here. This consists in a further enlargement of the nurses' home, and has been most happily carried out. The other objects for which the appeal was launched were a very complete and well-equipped out-patient department, and a new ward pavilion for paying patients, which has long been a crying want. The work on these two departments has already begun.

St. Mary Abbots Hospital, Kensington

The London County Council announces that the Bishop of Kensington will open a new operating theatre and *x*-ray department at St. Mary Abbots Hospital, Marloes Road, Kensington. The ceremony takes place to-day, Friday, January 15, at 3 p.m. The estimated cost of the new operating theatre and *x*-ray department, including equipment and engineering services, is approximately £13,500. The new buildings, covering an area of 5,100 square yards, are approached from the adjacent ward block by means of an enclosed corridor. St. Mary Abbots Hospital and

the adjoining institution occupy a site of about eight acres. The buildings were erected at various periods between 1870 and 1900. Since its transfer to the L.C.C. on April 1, 1930, the hospital has been "appropriated"—that is, it has been taken out of the scope of the Poor Law and is, so far as its accommodation permits, available to all residents in the county of London. During the quarter ended September 30, 1936, the average daily number of in-patients was 413. Since 1930 new accommodation has been provided for the maternity and gynaecological sections, and a pathological laboratory to serve a group of the Council's general hospitals has also been provided at St. Mary Abbots. Hydraulic lifts have been replaced by modern electric lifts; the two laundries which formerly served the needs of the hospital and institution have been combined and modernized, and other works of improvement are in hand. The Council is also proceeding with the adaptation and reconditioning of the institution buildings (which will be used for hospital purposes) in order to render them suitable for the accommodation of sick persons.

The Scientific Instrument Maker

Three floors of the Imperial College of Science at South Kensington were occupied during the first week of the New Year with an assembly of scientific instruments. The occasion was the twenty-seventh annual exhibition of the Physical Society. Two of the floors were given up to a trade section, and the third to a research and experimental section, to which the National Physical Laboratory largely contributed; but so many commercial firms now undertake research and experiment on a generous scale that the distinction is difficult to maintain. Amid instruments of all kinds, some of them belying in the unwieldiness of their names the symmetry and precision of their action, the microscope retained its pride of place. Probably there were more microscopes on view than instruments of any other kind, indicative of the place which microscopy and photomicrography have taken, not only in medical and biological applications, but in general scientific and industrial work and research. One feature was a double microscope for micro-dissection. In physiology, when micro-dissecting operations have to be carried out, it is often difficult for one person to do the whole of the manipulation alone. Some ingenious inventor has accordingly devised an arrangement enabling two binocular microscope bodies to be placed simultaneously back to back so that two workers can view and operate on the specimen at the same time. Next to these instruments for extending the human eye were instruments for intensifying the human ear. The sense of hearing, to judge from the instruments provided, seems to be increasingly appreciated. No doubt in time the prejudice against wearing hearing-aids, long since outworn in the matter of spectacles, will disappear. Some of the hearing-aids were very inconspicuous, notably one light-weight portable apparatus, embodying a carbon microphone, developed in the department of the education of the deaf at Manchester University. Making the deaf hear is not a simple matter of amplification of sound, and one firm specializes in automatic volume control in deaf-aid amplifiers. This control limits the sound output of the instruments to a degree tolerable to the user, and the distortion due to overloading of the output valve with loud sounds is prevented. In modern civilization the suppression of unwanted noise is at least as important as the amplification of desired sounds, and as a step to noise elimination and control there were noise meters on view, one of them designed to meet the requirements of the Air Ministry for the measurement of noise in aircraft, but capable of being used for other purposes also. Several examples of diathermy and short-wave apparatus were shown, portable and fixed; also a portable cardiograph with a camera having a continuous spool of paper driven at speeds from 20 to 80 millimetres per second. Another interesting device was a fluoroscope, a portable instrument, designed in collaboration with the Home Office, for medico-legal and other investigation.

Correspondence

Serum for Influenza

SIR,—On analogy with other virus diseases such as measles it seems reasonable to assume that serum obtained from patients convalescent from influenza might be of therapeutic benefit. The suggestion was, we believe, first put forward by Dr. Herbert French in 1919, but has never been practised, at any rate on a large scale. The recent researches of Laidlaw on the transmission of influenza to ferrets have shown that the creatures do in fact develop antibodies as the result of an attack. This would be a strong point in favour of the use of convalescent serum were it not that after a few months of immunity they become again susceptible, even though antibodies are still in the blood. Possibly, however, protection depends in part upon these substances and upon their degree of concentration in the body.

Our purpose in writing this letter is to ask those medical men who are now dealing with influenzal patients to obtain blood from them when they are convalescent. If they will send either the blood or preferably the patient to the bacteriological department, Guy's Hospital, a batch of mixed sera will be obtained and treatment of influenzal patients carried out with the usual controls. It is hoped in this way to decide whether the serum is of any value, and if so to aim at the collection of large supplies so that we may at last have some substance of definite therapeutic and prophylactic value to guard the population against future epidemics. Will those doctors who are good enough to collaborate in this manner kindly select only those patients in whom the diagnosis of influenza was unquestionable and preferably uncomplicated? Blood may be collected into a sterilized vessel by any of the recognized aseptic methods of venepuncture.

Instructions for Collection of Serum.—If apparatus is not to hand, on receipt of a message at Hop 1654 collecting apparatus will be sent to any medical man offering to send blood. This will consist of a sterilized needle and rubber connexion fitted to a sterilized 250 c.cm. screw-capped bottle. The skin over an arm vein should be carefully cleaned, the vein distended by pressure higher up the arm, and venepuncture performed in the ordinary way, the blood being run directly into the bottle. When this is nearly full the pressure on the arm is released, the needle withdrawn, a pad placed on the site of puncture, and the cap screwed on to the bottle. The blood should then be sent directly to this department. The whole procedure must be as aseptic as possible.

If the patient is sent to the laboratory for blood collection a preliminary telephone message to the above number would be appreciated.—We are, etc.,

A. H. DOUTHWAITE.
F. A. KNOTT.

Bacteriological Department, Guy's Hospital, S.E.1, Jan. 11.

Nutritional Anaemia in the East End of London

SIR,—I have read with interest Dr. Leonard Findlay's article in the *Journal* of January 2 dealing with haemoglobin and red cell estimations in children admitted to the wards of the Princess Elizabeth of York Hospital for Children. The subject is, I think, of great importance, and no one would lightly disregard conclusions drawn by Dr. Findlay, for whom I personally have a high regard. It is therefore with some trepidation that I venture to ask your readers to consider his findings critically before they conclude that widespread iron prophylaxis for infants is superfluous.

The blood in Dr. Findlay's cases was taken from the ear, but he does not mention details of technique. Dr. Paul Drucker, whom he quotes, has demonstrated that in infants the readings obtained from ear blood, as ordinarily taken, are remarkably erratic, and that to obtain readings from the ear that are not vitiated by capillary changes it is necessary to make a cut, preferably a deep one, with an extremely sharp instrument, such as a cataract knife (not an ordinary scalpel). On the other hand, readings obtained from blood taken from the heel of the infant, with the usually accepted precautions, are much more constant. Furthermore, values obtained from ear blood with a scalpel cut are higher than those from the heel: in babies under 1 year old in Drucker's series the difference varied from − 3 to + 38 per cent. He gives an example. A baby of 3½ months showed ear readings varying from 113 to 89 per cent.; the corresponding heel readings were 78 and 79 per cent. In babies under 6 months old the ear readings averaged 13.5 per cent. higher, but by 2 to 6 years old the difference had diminished to an average of 3.5 per cent. Using a cutting needle for pricking ear and heel respectively, my results, on a very much smaller series of cases, corresponded with Drucker's in giving high and erratic readings for ear blood. Hence, unless Dr. Findlay used a cataract knife, making a deep cut in the ear, it is probable that individual readings of his infants should be reduced by anything up to 38 per cent., which would give a very different complexion to his figures.

In the light of recent work, has not Dr. Findlay accepted too low a curve for his "lower level of normal"? In any case I think I can claim to have proved that babies of 6 to 12 months old whose average haemoglobin level was on the whole slightly *above* Dr. Findlay's "lower limit of normal," but whom I should call slightly anaemic, had a markedly increased morbidity rate as compared with those whose haemoglobin was kept at a higher level by giving extra iron. I have at the present time a series of babies under observation whose average haemoglobin has been kept consistently at 82 to 85 per cent. from 5 to 18 months old by this means.

The Queen's Hospital for Children, like the Princess Elizabeth Hospital, is in the East End of London, and happily there is no doubt that among our patients severe nutritional anaemia in infants is much less frequent than ten years ago. This, I believe, is due to the recognition of the need of widespread prophylactic treatment with iron. That anaemia of a lesser grade is common is, I think, indicated by Dr. Findlay's own figures. It would be a calamity for the babies if Dr. Findlay, with his wide influence in the paediatric world, persuaded us to cease our efforts to stamp out nutritional anaemia among them. —I am, etc.,

London, W.C.1, Jan. 11. HELEN M. M. MACKAY.

Pathogenesis of Cancer

SIR,—About three years ago you were good enough to publish a letter from me giving expression to my view of the cause of cancer. I did not expect to trouble you again; but after many years of failure in my endeavours to obtain any consideration for it by those engaged in cancer research I have been encouraged by some recent letters in the *British Medical Journal* to think that others are trending the same way. The view was that cancer commenced in the tissue intended for the repair and maintenance of the organs and other anatomical structures of the body, and that it always showed strong indication in structure of the tissue in which it arose. When it was possible to obtain the growth in its very earliest stage it could hardly be called malignant, and was curable by complete removal. For a long time I blamed over-nutrition for encouraging overgrowth in tissues intended only for normal needs, but of late years, with the help of fresh knowledge, I have felt more and more impressed by the possible influence of sex hormones. One needed to find some process which would cause the—perhaps unstable—repair cells to take on the embryonic type of cancer cells. I used to regard over-nutrition and over-sexed conditions as the cause of cancer, and now the association seems to become more and more clear.

Cancer is probably, almost certainly, very rare or quite unknown in the *really* wild life of any class of animal; but it is common, and almost yearly becoming more common, in man and all domesticated animals encouraged to lead a life more or less based on human habits. This leads one in looking for the cause to believe that we should study the influence of habits. If we could see back to the earliest stage of the wild life of man, when he had to search and fight for enough food to live on, or often go without, when his sex functions only came into use when they were definitely required for procreation, was there any cancer? I think not. But as man's intelligence gave him gradual control over the animal world so he became more capable of luxury and more inclined to induce his womenfolk to disregard nature's habits. Thus gradually he has brought about in the course of countless centuries a greater and greater domination of the sex glands.

On such lines we have to search for the cause of cancer: an evolutionary cause—not a germ; a castigation for mankind to stamp out his errors, or himself. Natural life in this world has to fight for its existence. Things should not be too easy for us if we are to be strong and healthy. The struggle for existence must go on; we must labour and fight. Signor Mussolini and Herr Hitler are the "wise men" of modern days. They have recognized the change that was needed, and stand, perhaps unconsciously, as leaders in the search for the much-longed-for "cancer cure." They have each planned for their entire populations the widest possible health experiment. Good luck to it! I hope they will let us know while the fat countries are becoming more cancerous if they are growing less so. The banishment of luxury, the recognition of the value of honourable labour and of the generous spirit to fight for home and country, must deserve and reap its reward.

I am now in my eighty-sixth year, and still hope that some may accept the reasonableness of my belief and tear themselves from their experiments on cancerous mice to test the possibilities of controlling the influence of sex glands. My faith rests mainly on the regeneration of the human race—a very slow process. But in the meantime they might discover a method of treatment which would give a better result than any we can at present obtain. —I am, etc.,

Grayshott, Surrey, Dec. 28, 1936. FRANK T. PAUL.

Substances Promoting Cell Growth

SIR,—Dr. Needham's article in the *Journal* of October 10, 1936 (p. 701) is interesting and his ideas on the origin of cancer are intriguing, but perhaps a little criticism from one completely outside the realm of cancer research might not be amiss. Dr. W. Cramer's letter (*Journal*, November 14, 1936, p. 997) emboldens me now to state what I have thought for many years.

On account of its histological appearance some pathologist, in the long ago, spoke of malignant tissue as embryonic. Ever since, many of those who think about

cancer have suffered from the delusion that cancer and embryology can somehow be made to explain each other. But really cancer and tissue from the embryo are as the poles asunder. The embryo is an epitome of biological history and contains all the future of the race. Cancer cells, on the other hand, are at the end of their tether; they are poor things—somatic cells that have almost run their course. They have this in common with embryonic cells: they are in a state of rapid division—but no more. In contrast with the richness of function in true embryonic cells cancer cells are functionless; in contrast with the virile youth of the embryo they are senile. The embryonic cells are designed for rapid division and rapid differentiation; the rate at which they divide is normal to them. Malignant cells divide rapidly, contrary to their normal habit. Far from becoming more differentiated, descendants of malignant cells tend to lose all trace of differentiation; they retain only the lowest common denominators of living matter—the capacity for division and for absorbing nutriment. Therefore it seems to me useless to look to the embryo for an explanation of cancer. One must regard cancer as a disease with origin and end peculiar to itself. It is no attempt upon Nature's part to commit suicide; but for the fact that it is composed of living cells it has no connexion with the past; its unit is a cell that has lost its memory.

In considering the question of a chemical origin for cancer two aspects must be separated from each other: (1) growth stimulants—the carcinogenic substances—and (2) internal metabolic derangement of the cell.

(1) For growth stimulants to be the sole producers of cancer they must continue to act when the cancer has buried itself in the tissues of its host. Down there, carcinogenic products of coal tar (probably so misnamed) can hardly continue to pursue it. Where, then, can the stimulators come from? There are three possibilities: the blood stream, the cancer itself, or the adjacent tissues that are forced to secrete such a substance. (i) If the growth stimulant comes from the blood stream one has to imagine some source from which the blood may derive the stuff, which must have some function other than the production of cancer. If one can avoid these difficulties the question then arises, Why is there, anywhere in the body, a single cell, similar to the original cancer cell, that is not cancerous? (ii) There are two objections to the suggestion that the stimulant comes from the cancer cells themselves. First, nowhere in Nature do cells primarily secrete substances for their own stimulation. Simple organisms depend in the first place directly on external stimulation. Complex organisms depend on a chain of internal secretory organs beginning with some controller that is indirectly in contact with the outer world. Secondly, the chemical growth principle ought to be recoverable from a mass of cancer cells, and if the substance behaves like any other principle it ought to increase quantitatively with increasing size of the cancer. So, the longer a cancer exists the more likelihood ought there to be of the appearance of many cancers.

(2) Does the growth stimulant arise from some internal metabolic disorder in the cancer cell itself? No cell grows or does anything else but die if it be not stimulated to live. In life stimulus comes from without; the primordial cell and the latest man are equally designed to fit environment in so far as they are living things. If stimuli did not come from without it is hard to imagine how even a unicellular organism could begin to exist. The clearest example of what I have been saying is in the physiology of reproduction. The Graaffian follicle activated from the outside produces an ovule which, by the action of some other stimulant, is induced to become receptive. The sperm cell penetrates to the nucleus and supplies the stimulus that initiates foetal development. A living thing like the sperm cell is the only imaginable thing that could thus exercise a continuous stimulation during the whole course of development.

There is some evidence from heterogeneous grafts. Sooner or later they die out because their normal stimulus to live is not forthcoming; in spite of the most complete vascularization they die.

It seems to me that a hypothesis which requires self-stimulation on the part of the cell is the most highly improbable that imagination could conceive. By its terms Nature is supposed to act as she has refrained from doing during the whole course of evolution. It is so far away from probability that one should examine, examine, and yet again examine all other hypotheses before falling back on such a one. I would like to make the following suggestions.

Cancer is not due to any single principle operating alone, but is the result of a sequence of events acting on cell life. First, there is an accelerated growth of cells. Whether this is due to direct stimulation from coal tar and the like, to the natural flux of new developing tissue accelerated by an irritant, or to the efforts of an old cellular system to fill gaps left by the destruction of some of its units, is immaterial. This acceleration of division I call factor "A." Under the influence of "A" there will appear from time to time a defective cell, factor "B." How is "B" defective? A normal cell protects its own nucleus against the intrusion of extraneous matter; "B" is defective insomuch as it fails in this respect.

Factor "B" is now in a medium of dead and dying cells mingled with organisms. Out of the hurly-burly, in the manner of a sperm cell, something enters the defective cell, pushes its way through the cell body, and reaches the nucleus. This something I call factor "C." "C" may be: (1) represented by a conjugation of two more or less similar cells (as suggested by Drs. McKillop and Duhig of Brisbane); (2) a detached but viable chromosome; (3) a living micro-organism. The result of this intrusion may be one of three things: (*a*) the cell is killed; (*b*) the intruder is killed; (*c*) neither may be strong enough to kill or weak enough to die, an uneasy partnership resulting. In this case the cell is potentially a cancer.

Enter factor "D," the body resistance of the prospective host. The elective cancer must defeat factor "D." Defence in the end must be effective more or less according as the differences between normal body cells and invading cells are more or less marked. As is well known, bacteria evoke a profound and persistent reaction of the defensive apparatus; in protozoal infection the defence is less energetic because the invader is not so definitely marked off from the cells of its host. There is such little difference between cancer and the body cells that, in this disease, the defensive effort needs to be carefully looked for in order that the observer may be aware of it at all. Now the defective cell, invaded by "C," which has slipped past factor "D," holds the field. The new nuclear companionship, a pseudo-conjugation, is, as I have suggested, an uneasy state of affairs. Each party inflames the other; a nucleitis, transmitted from each generation of cancer cells to the next, spurs on the rapid and anarchistic division.—I am, etc.,

Brisbane, Dec. 8, 1936. WILLIAM P. KELLY, F.R.C.S.I.

Malignant Disease of the Pharynx

SIR,—I was much interested in Mr. Robin Pilcher's article on the diagnosis of malignant disease of the pharynx (*Journal*, January 2, p. 13), and there is no doubt about the neglect in the making of an early diagnosis. A busy surgery like an overworked out-patient department is not conducive to good work, and this may account for the practice of prescribing gargles instead of attempting to use a laryngeal mirror. His remark on the part played by oral sepsis in its association with malignant disease of the pharynx is very important, and I am rather surprised to see him leaving out the definite picture of "a mouth like a cesspool with a plug of cotton-wool in the ear." How many ears are syringed to cure the earache

while the real cause lies in the pyriform fossa? Surely earache can be regarded as an early sign.

Since the article is concerned with early diagnosis, I am wondering what made Mr. Pilcher decide to leave out the precancerous phase of this disease. As an example, I mean the sensation of a lump in the throat associated with the picture of dysphagia and anaemia, especially in women between the ages of 30 and 50 (the Paterson–Brown Kelly syndrome). It is not often that one finds an organic basis for the "lump in the throat" in the stout neurotic woman, but the pale, thin, anaemic woman complaining of a "lump in the throat" demands very close attention. To my mind there is a close relationship between this sensation and normal salivary flow. The apprehensive sensitive woman can easily upset her autonomic nervous balance, and with a resulting sympathetic control saliva is diminished and the cricopharyngeus is tightened. This in the thin anaemic woman over a period of years can cause a post-cricoid lesion. I often wonder whether her edentulous, stout, non-anaemic sister is as liable to the same danger. I cannot give actual figures, but my impression is that she is not.—I am, etc.,

Cardiff, Jan. 5th. ROBERT D. OWEN.

Allergy and Agranulocytosis

SIR,—In his interesting article on agranulocytosis and amidopyrine (*Journal*, November 7, 1936, p. 911) Dr. S. C. Dyke states: "Plum performed an intradermal test with a small dose of amidopyrine on a subject known to develop agranulocytosis after ingestion of the drug, but obtained no skin reaction. This appears to offer conclusive evidence against the 'allergic' theory." This statement shows some lack of familiarity with the essential known facts relating to allergy. I think that all workers who have extensive opportunities of observing allergic patients will agree that as a rule gross idiosyncrasy to a drug may exist without any skin reactivity to that drug. Hypersensitiveness to aspirin is surely a fairly typical "allergic" phenomenon, and yet most authorities consider it most unusual to find any skin reactivity to it. Personally I have never seen a skin reaction to it. It is generally assumed that the aspirin, after ingestion, combines with some naturally occurring substance in the body fluids to form a compound which gives rise to the typical allergic phenomena. Some of Landsteiner's work seems to support this theory. The word "allergy" has often been misused, but it still conveys a fairly definite and uniform meaning for those especially interested in that work. It would seem to be a serious mistake to regard a phenomenon as not "allergic" simply because no skin reactivity could be demonstrated in connexion with it.—I am, etc.,

CHARLES SUTHERLAND, M.B., M.R.C.P.

Melbourne, Dec. 22, 1936.

Urinary Proteose in Asthma

SIR,—In the paper by Drs. Libman and Bigland (*Journal*, January 9, p. 62) it is stated that the erythema on the skin produced by the proteose of Oriel and Barber is non-specific and is due to a toxic action. Also, van Leeuwen (1932) found that the proteose did not necessarily produce reactions in asthmatics from whom it was prepared. Oriel states that it contains the antigen, and that there is a very violent poison present, which also acts as an antigen. At first only 0.5 c.cm. of a dilution of 1 in 1,000,000 can be administered. It is not known what this toxin is, but it is possible that it may be derived from the anaphylatoxin which is separated in the urine. It would seem to be an advantage if this substance could be separated from the proteose. Oriel thinks the blood has difficulty in dealing with the proteose, and that the administration of peptone assists the blood to digest it.

I have no practical knowledge of this proteose, but I think the figures given by the writers show that they have been using the lowest doses of the Armour peptone. I have found in the last two or three years that Witte's new peptone 30 is best, and it may be given in doses rather larger than the Armour peptone, though the variation in patients is very great. As Dr. Hutchison (p. 57) says in the previous article, "Every individual is really a new amalgam or experiment."

Those who write on the peptone treatment of asthma all say that its action is unknown. May I venture to remark that there seems to be a clear-cut action? It was found by Abderhalden that when a heterogeneous proteose or peptone is parenterally introduced both the rotation in the polariscope tube and dialysation show the production of proteolytic and peptolytic defensive ferments which produce their assimilation. The allergen-reagin product in asthma is doubtless a peptone, and it would succumb to this ferment.—I am, etc.,

London, W.1, Jan. 9. A. G. AULD.

A Pitfall in the Diagnosis of Bence-Jones Proteinuria

SIR,—Last year I was asked to see a middle-aged man who was thought to have Bence-Jones protein occasionally in his urine. By ordinary examination of the patient he seemed somewhat overworked and anxious, but otherwise well. The supposed abnormality in the urine had been recently detected in the course of a routine periodical medical examination. In a urine of specific gravity 1020, *faintly acid* to litmus paper, there was no precipitate on heating slowly to the boiling point, except an ordinary phosphatic turbidity which cleared up on the addition of dilute acetic acid, but on cooling the test tube under the cold-water tap a precipitate occurred, which disappeared on reheating, and so on. In this case it was easily proved by the various recognized tests that the precipitate was of urates and not of Bence-Jones protein.

If the Bence-Jones proteinuria had been genuine it would have been practically equivalent to a death sentence, and the patient had apparently got some idea into his head of the gravity of the condition. The reaction in question would be observed frequently if doctors looked at the test tubes containing boiled and acidified urine an hour after the boiling. I have had to go back a long time to find a published case in which such a mistake may have arisen. In 1901 in the *British Medical Journal* (1901, **2**, 713) there was a note by Dr. J. A. Blair on a "Case of Albumosuria," referring to Dr. T. R. Bradshaw's account of what we should now term "Bence-Jones proteinuria." Dr. Blair's patient was a man aged 64 years, whose urine he examined during a severe illness. Regarding the supposed "albumose" he wrote:

"It had the characteristic reactions of being precipitated in the cold by nitric acid, of dissolving in the heat, and of reprecipitating on cooling. The urine was acid in reaction, dark in colour, and gave no perceptible precipitate on simple heating without acid"

In regard to Dr. Blair's patient gradual improvement took place and at the end of ten weeks he was able to go away for a change of air, and he was not seen again. "Each time the urine was examined albumose was present in considerable quantity." I have little doubt that the supposed "albumose" precipitate was not of Bence-Jones protein, but only of urates, as in the recent case I mention.—I am, etc.,

London, W.1, Jan. 8. F. PARKES WEBER.

Metabolic Factor in Rheumatism

SIR,—I read Dr. R. G. Gordon's article in the *Journal* of December 19, 1936 (p. 1243), with great interest. It was refreshing in these days of scepticism about "focal sepsis" to find that he "would deprecate an abandonment of the orthodox search for a focus of infection."

Briefly, it would appear that there are only three rheumatic conditions in which he is of opinion that a focal infection may be of aetiological significance—namely, spondylitis ankylopoietica, true rheumatoid arthritis, and certain cases of fibrositis. The question as to whether there may or may not be other forms of rheumatism in the production of which focal sepsis plays a part is too controversial to go into in detail here; suffice it to say that of past years the question of focal sepsis has been ridden to death, with the result that it has fallen into considerable disrepute. The actual causes for the odium with which it is regarded in many quarters will generally be found to be (1) slapdash methods of investigation, resulting in (2) lack of precise localization, with consequent (3) indiscriminate operative procedures; and lastly (4) the difficulty of eradicating an infective focus when found.

It is neither scientific nor logical to discard a line of investigation which may result in benefit to the patient just because it has proved useless in certain cases though of use in others, or because the object of such investigation when found proves in many cases to be difficult of eradication. Strong enough emphasis cannot be laid on the fact that the search for a septic focus must be thorough. It is not justifiable, for instance, to assume that the tonsils must be to blame just because they look unhealthy or because pus can be expressed from their crypts, or even because haemolytic streptococci can be cultured from them. Many of us must have seen rheumatic cases in which tonsil enucleation has been performed, but in which instead of an improvement an actual aggravation of the patient's condition has resulted. Probably the explanation is that the tonsils had become secondarily infected from a primary focus in a paranasal sinus while doing their best to exercise their protective function, and that with their removal the sinus focus has been given ample unbridled opportunity to produce its undesirable results. In all such cases, therefore, most careful investigation of the paranasal sinuses should be carried out, and it is only in the definite absence of any evidence of a septic focus in their intricate system of cavities that the tonsils should be touched; while if such a sinus focus is found it should be adequately dealt with before tonsillectomy is even to be considered.

Again, the mere failure to find profuse purulent discharge by anterior or posterior rhinoscopy does not justify the assumption that the paranasal sinuses are perfectly healthy; for what, after all, does the finding of frank pus signify? Surely merely that the patient's reaction to a sinus infection is vigorous and that the particular sinus ostium is patent. I would go further and suggest that where the search for a septic focus is indicated the very failure to find pus demands that a most detailed investigation should be carried out, and the following brief outline shows the further procedure to be adopted.

A.—Examination of the pharynx may show a well-marked ciliary stream on one or other side.

B.—Nasal endoscopic examination should be made, as recommended by Dr. P. Watson-Williams. The following may be found: (1) congestion near the mouth of a sinus; (2) a group of small polypi in the same region; (3) a vascular leash in an atypical position. (4) Oedema of the middle meatus; (5) thin ropes of secretion stretching from one or other turbinate to the septum, choanal margin, Eustachian cushion, or to each other; (6) a stream of purulent discharge coming from superior or middle meatus or from the sphenoidal ostium. Negative findings indicate repetition of the procedure after a few days' interval.

C.—Radiographs should be taken, preferably in the Graham-Hodgson positions.

D.—If the findings to date are suggestive suction lavage of both antra, posterior ethmoidal cell groups, and sphenoidal sinuses should be carried out and samples of the sinus washings sent for bacteriological examination.

E.—Lastly, if the bacteriological findings are positive in any sinus or group of sinuses the Lowndes Yates dye test should be performed to determine whether the suspected sinus or sinuses are giving rise to toxic absorption, or whether fibrotic changes in the sinus mucosa are protecting the organism against auto-intoxication from it.

It is only after the various stages of the above exhaustive investigation have been completely run through with negative results that it is permissible to say that no septic focus exists in the paranasal sinuses, and that therefore if any toxic focus is responsible at all it must be situated in the teeth, tonsils, or intestinal tract.

A further point is this. When one considers that in the early stages of a sinus infection the organisms lie on the surface of the mucosa but with the passage of time burrow ever deeper till they gain the lymph spaces and so eventually the blood stream, it is surely not difficult to suppose that when they enter an area where recent traumatism or strain has lowered the local resistance they tend to settle there and establish, as it were, secondary infective foci, around which proliferation of fibrous tissue occurs with nodule formation. The removal of the original primary toxic focus will not clear up these secondary foci, and it is advisable, when other methods of treatment such as those outlined by Dr. Gordon plus removal of the primary focus have failed to cause certain of the painful nodules to subside, to inject them directly with lipovaccine, as recommended by Dr. Laughton Scott in the *Journal* of February 15, 1936. The results are said to be in many cases satisfactory and lasting.—I am, etc.,

Bath, Jan. 4. C. A. HUTCHINSON.

Treatment of Prostatic Obstruction

SIR,—I was much interested in the article by Mr. J. Cosbie Ross on prostatic obstruction, which appeared in the *Journal* of December 26, 1936 (p. 1297). With most of his remarks I agree; but there are some open to discussion. I am pleased to note that he considers routine cystoscopy necessary in all cases presenting prostatic symptoms, a procedure which I have always emphasized, but he makes no mention of routine posterior urethroscopy, which is even of more value. Cystoscopy alone gives no picture of the prostatic urethra; it merely delineates the appearance of the vesico-urethral orifice. Many cases of prostatism reveal no abnormality either on rectal or on cysto-

scopic examination. Urethroscopy alone will show the true condition. In some cases it may be a pronounced prostatic bar, in others a unilateral lobe enlargement producing a pressure concavity on the other side. By cystoscopy alone a prostatic bar cannot be adequately diagnosed; only urethroscopy will reveal its true size.

I agree with Mr. Ross on the types of cases that he states definitely call for endoscopic resection, but I disagree with him entirely in the types he maintains are not suitable. I have operated on many cases where the inverted V angle was less than 40 degrees, and in many where there was practically no angle, but the lateral lobes approximated. In these cases if the middle lobe protuberance is ablated, and if the lateral lobes are sufficiently undercut and resected, then a cure is always obtained. I am using the word cure in a symptomatic sense, but I have had no case yet (six years) which has required a repeat operation, and all my cases are under constant supervision. I dislike Mr. Ross's advocation of prolonged indwelling catheter drainage of the bladder; if over a week I prefer suprapubic drainage by means of a de Pezzer catheter. I notice he mentions that suprapubic drainage as a preliminary is useful in some cases suitable for resection, for afterwards continuous irrigation with sodium citrate may be carried out. Continuous irrigation is not dependent on this preliminary procedure, for in all cases of resection continuous irrigation with sodium citrate is an advantage. This may be carried out by passing a twin-channel catheter, which has been made for me by the Genito-Urinary Manufacturing Co., or by passing two catheters—Nos. 8 and 10 F. These cause no discomfort to the patient, and are usually removed in two or three days. Unless haemostasis has been adequate before the catheters are passed it will be necessary to half fill the bladder with the citrate solution before the patient leaves the operating table, otherwise clots may form in the bladder before efficient ward routine is instituted.

Apart from cases of diverticula and calculi there are only two types of prostatic obstruction which cannot be treated by resection. The first is where a cystoscope cannot be passed into the bladder because of the enormous enlargement of the prostate. I have had one such case. The second is where the prostate is so uniformly enlarged that no vesico-urethral obstruction is apparent. Generally at least 96 per cent. of prostatic patients can be successfully treated by endoscopic resection. The only objection to this routine treatment is the fact that a proportion (20 per cent.) of apparently normal prostates show on routine serial microscopy to be malignant, and although the pieces removed by resection may be reported by the pathologist to be benign, occasionally malignant manifestations appear later. This, however, is of no practical importance, for a malignant prostate once diagnosed is not amenable to curative treatment. Suprapubic drainage prolongs life for as long as any radical operation or radiological treatment. A malignant prostate kills slowly but surely.—I am, etc.,

London, W.1, Jan. 3. F. McG. LOUGHNANE.

Recurrent Extragenital Haemorrhages

SIR,—May I trespass again upon your space to add a few words to what I wrote in the *Journal* of January 9 (p. 69). By a coincidence the girl whose history formed the basis of my remarks in that paper returned temporarily to Kendal and came to see me last week, thus giving me an unexpected chance of discovering any further developments, but too late to add to my previous account of her case. Briefly, what she had to tell me was this:

She has had "fits" since she left the Royal Southern Hospital, Liverpool, in July, 1936.

All the extragenital sources of haemorrhage have "dried up" with the exception of the eyes, from which she has had slight occasional bleeding, at times unassociated with menstruation and, in addition, at each period. On one occasion such haemorrhage was apparently substitutional for the period (November).

Menstruation has been regular since August, but for one lapse at the end of November, 1936. The periods have recurred, with that exception, every four weeks and lasted four days. In early September her period was a few days late. It lasted four days and was accompanied by slight haemorrhage from the eyes. In early October the period lasted three to four days and there was no additional bleeding. In early November the period lasted four days and there was slight haemorrhage from both eyes. At the end of November there was no period, but slight bleeding from both eyes off and on for three days. At the end of December the period began on the 29th and lasted four days. She bled from the eyes slightly on the morning of the second day, the same evening, and the following morning.

It must be admitted that very considerable improvement has been made. I believe that the girl has taken to heart the encouragement and advice tendered to her—namely, that she is in no sense abnormally made; that she is not an epileptic; that, if she can convince herself that these haemorrhages have been aggravated, even if not entirely caused, by her unconscious dwelling upon the less pleasant details of menstruation, they will cease; and that she will in time be completely cured.—I am, etc.,

Kendal, Jan. 9. WILLIAM H. GOSSIP.

The Consistency of University Examinations

SIR,—In his interesting comments on Dr. W. Gilbert Millar's paper (*Journal*, December 12, 1936, p. 1209) Mr. John L. Hardie, in your issue of January 2 (p. 44), enters a few useful caveats against the too ready acceptance of the "somewhat sweeping generalizations made in summary form at the conclusion of the article." Dr. Millar's interesting paper was essentially an attempt to assess statistically the value of what is known as the combined examination in the third year of medical study in Edinburgh, introduced seven years ago. In spite of expressed doubts about the validity of some of Dr. Millar's general conclusions, Mr. Hardie writes that "the prognostic value of the combined examination in the third year seems fairly well established," and expressed himself in favour of "this type of investigation being extended to other medical schools and the results compared." I venture to express the hope that no such extension in relation to the third year's curriculum of medical study will ever take place, and, stated very briefly, for the following reasons.

In his paper Dr. Millar reported how in 1928–9 an important modification in the third year's teaching was introduced whereby the systematic teaching in pathology, bacteriology, pharmacology, therapeutics, medicine, and surgery was co-ordinated so that the student is, so far as possible, taught all aspects of a particular disease at the same time. In the first six months of this year the student also gets his first and main introduction into practical medicine, by attendance at clinics and personal study in the medical wards, etc. If the student fails to get a diploma in the combined examination in the six or twelve months he may lose six or twelve months and be otherwise prejudiced. It is only natural that after two or three months in the wards the examinations ahead begin to loom largely. I do not for a moment suggest or admit that the teaching of these six subjects, either before or

after the introduction of this "combined" system, is one whit inferior to that of any other medical school. But my experience of five years' teaching of clinical medicine in Edinburgh when this modification was in vogue convinced me that the change could not be regarded as a beneficial one. It tended, if anything, to aggravate the cramming system so prevalent in medical education to-day, and, in general, to foster a type of medical education which is out of touch with modern requirements.

The few years' experiment in Edinburgh has, however, been a useful one, and will have fulfilled a useful purpose if the limitations to its success are fully recognized. The more effective co-ordination of modern medical teaching on the lines stressed by the British Medical Association is, in my view, the greatest medical need at the present time. Too much attention can be focused on mere "academic co-ordination" to the exclusion of "practical co-ordination" of a kind calculated to arouse and sustain the intelligent interest of the student. It is, I think, a good omen that many of the present Edinburgh teachers are alive to these needs.—I am, etc.,

CHALMERS WATSON, M.D.

Fenton Barns, Drem, Jan. 5th.

Diphtheria Immunization

SIR,—Dr. Bousfield puts me to the trouble of writing to explain what I mean by the term "anaphylaxis."

Anaphylaxis is a state of supersensitiveness to the action of a foreign protein brought about by the previous introduction of that protein (sensitization). As to Dr. Bousfield's hundred thousand series, in which many of the children had had a previous introduction of that protein and yet there was no anaphylaxis—well, I can only say that such does not make sense. For the term "anaphylaxis" arose originally out of the very numerical experience which Dr. Bousfield relates as his. Anaphylaxis may be inherited or acquired. Asthmatics, children of asthmatics, children of the lymphatic (status lymphaticus) type, and those associated with horses are particularly to be watched. If anaphylaxis is to be so easily explained away as Dr. Bousfield does, what is the reason for testing for hypersensitiveness and for the treatment of the preparatory kind by desensitization, known to all G.P.s?—I am, etc.,

Athenry, Co. Galway, Jan. 2. C. H. FOLEY, M.B.

*** This correspondence cannot be continued.—ED., *B.M.J.*

Surgeon's Liability for Nurse's Negligence

SIR,—The medico-legal article in your issue of January 2 deals with a subject on which I wish to make some comments and a suggestion.

In Crotch *v.* Miles (*British Medical Journal*, 1930, **1**, 620) Sir Hugh Rigby said in evidence that the theatre sister is a highly skilled person "responsible for the instruments and their sterilization, the towels and the swabs, and that the duty of counting instruments and swabs falls, according to the usual practice in this country, on the theatre sister." This expression of surgical opinion makes a clearly defined division of responsibility as between surgeon, theatre sister, and, by inference, the whole of the theatre staff; and it is a source of satisfaction that this principle has found admission by the law in the case of Ingram *v.* Fitzgerald.

In surgical practice, in the operating theatre and elsewhere, the division of duties and the division of responsibilities are clear-cut. Fuller reference to these duties is made in a letter published in the *Law Times* of June 15, 1935. A comparison may be made with an air service, where the division of duties—and responsibilities—between the pilot and the ground staff is also clear-cut. But this principle does not appear to have met with universal recognition in the eyes of the law, or how could Lord Hewart, in Crotch *v.* Miles, have pointed out that the jury must ask themselves whether the surgeon on the day in question ought personally to have counted the instruments, or whether he was entitled to say that it was the job of the skilled theatre sister, and that he was entitled to act on her report? There is little doubt as to what answer would have been returned to this question by a body of doctors or nurses familiar with the usual practice. But what answer, if any, was given by the jury, unfamiliar with the usual practice, your commentator does not state.

No surgeon believes that in relying on the theatre sister for the count of instruments and swabs and for other technical services, and on the theatre staff for their duties, he is transgressing the law. But if in law he is not entitled so to rely in the cases which go wrong, and about which legal action is taken, so equally he transgresses the law in so relying in the thousands of surgical operations whose records never see the light of day in the law courts.

A writer in the *Law Times* of March 28, 1936, under the title "Doctors, Surgeons, and Patients," gave the impression that we must be content to leave this matter in uncertainty pending a full-length decision of the House of Lords; but I suggest that a statement of the medical view on the division of the duties and responsibilities as between surgeons and nurses, if compiled and published by the British Medical Association, must carry weight when cases of this nature are considered and decided in courts of law.—I am, etc.,

Worthing, Jan. 6. C. GIBSON.

*** We have referred Dr. Gibson's letter to our medico-legal correspondent, whose reply follows.—ED., *B.M.J.*

In Crotch *v.* Miles the jury decided the case on other grounds: that the forceps had not been left in at Mr. Miles's operation at all. They therefore did not have to express an opinion on whether Mr. Miles was entitled to rely on the word of his theatre sister. Dr. Gibson should not assume that the decision in Ingram *v.* Fitzgerald (which is in any case binding only in New Zealand) lays down any far-reaching principle of law; it only decided that in the particular circumstances the surgeon was not responsible for the negligence of the nurse who painted the patient with iodized phenol instead of tincture of iodine. When a surgeon relies on his theatre staff to perform their allotted duties he does not transgress the law, because there is no principle or enactment of law which forbids him to do so. Prima facie, however, since he is in charge he is liable for any damage which may result to the patient from the negligence of one of his team, though he may in certain circumstances, as in the New Zealand case, be able to show that in those circumstances the nurse was carrying out a duty for which she alone, and not he, could be properly held responsible. The point is that, in the present state of the law, the surgeon is not automatically discharged from all liability for the acts of his theatre team, and the court will always scrutinize the particular circumstances and ask the question whether, in these circumstances, he could have been expected to exercise personal supervision or not. This is probably one of the many instances in which law does not truly reflect the universal practice. It could only do so

if Parliament enacted, or the House of Lords decided, that the surgeon could never be held liable for an act of negligence by one of the team. The House of Lords does not often commit itself to a pronouncement of law which goes beyond the limits of the particular case it is deciding, and it is equally difficult to imagine Parliament passing an Act exonerating all operating surgeons from vicarious negligence. Moreover, though a statement by the British Medical Association would undoubtedly be valuable it is difficult to see how it could ever be put in evidence as part of a surgeon's defence.

The New Journal Typography

SIR,—May I venture to offer you my respectful congratulations on the new format of the *Journal*—congratulations tinged perhaps with some small shade of regret. Many years ago I had a cocker spaniel whose joy and pride it was to pick out your classic paper from a heap of the less excellent and to fetch it to me when asked to do so, sometimes, indeed, asking to be asked. On seeing the *Journal* in its new dress I thought of him, and wondered how long it would have taken the conservative little creature to recognize it in its new habiliment. Some regret at the absence of the familiar he would have had; but surely his good "sense" would soon have taught him that here was his old accustomed friend though dressed in other garb.

There may be some who will regret the passing of the familiar ("Some more time must wear the print of its remembrance out"), but in its new guise the *B.M.J.* has for me an added dignity in keeping with its great traditions, and a clarity of type as pleasing as it is restful to the eye.—I am, etc.,

Oxford, Jan. 4. R. MCCARRISON.

SIR,—Hearty congratulations on the new format. I like it, and the superior blackness of the type appeals very strongly to one whose eyes are wearing out. I don't say I shall read *more* of the *Journal*—I have always read a great deal of it—but I am sure I shall read what I do read with greater comfort.—I am, etc.,

London, W.1, Jan. 5. ALFRED COX.

SIR,—As editor of the *Medical Women's Federation Quarterly Review*, may I be allowed to offer congratulations upon the new aspect of the *British Medical Journal*? The new cover is a great improvement and looks extremely well, especially as advertisements have been eliminated. The types throughout are very clear and readable. I am sure the change must meet with the approval of all members of the British Medical Association.—I am, etc.,

London, W.1, Jan. 8. VIOLET KELYNACK.

SIR,—May I add my thanks to those of your other correspondents? I expect that I am one of the most persistent of *B.M.J.* readers, and the new type and method of presentation literally doubles the value of the paper so far as I am concerned. I know enough about these problems to realize the amount of thought, knowledge, and experience that has gone to the making of the *B.M.J.* for 1937.—I am, etc.,

London, E.1, Jan. 9. HARRY ROBERTS.

*** The letters printed above, and those printed last week in this column, are a small selection from many kind messages received since New Year's Day. On behalf of everyone concerned in the change of typography we thank all the readers who have sent congratulations.—ED., *B.M.J.*

Obituary

SIR DAVID SEMPLE, M.D., D.Sc.

Lieutenant-Colonel R.A.M.C. (ret.)

Lieut.-Colonel Sir David Semple, R.A.M.C. (ret.), died on January 7, aged 80. He was born on April 6, 1856, the second son of the late William Semple of Castlederg, County Tyrone, and was educated at Foyle College, Londonderry, and at Queen's College, Belfast, graduating M.D. with honours and M.Ch., in the Royal University of Ireland in 1881. Subsequently he took the D.P.H. at Cambridge in 1892, and in 1919 Belfast University conferred upon him the honorary degree of D.Sc. Entering the R.A.M.C. as surgeon on February 3, 1883, he became lieutenant-colonel after twenty years' service, and retired on June 14, 1905. From 1904 to 1909 he was assistant professor of pathology at the Army Medical School, Netley. Then, going for a tour of duty to India, he founded the Pasteur Institute at Kasauli in 1900. Before that time anyone bitten by a mad dog in India had to go for treatment to Paris, a journey of three weeks. In 1905 Semple became director of the Central Research Institute at Kasauli, and held that post until 1913, when he went to Egypt as Director-General of the Public Health Department in that country, holding that post till the end of the war in 1918. In India he was a member of the Central Committee for the Study of Malaria from 1909 to 1912, and of the Scientific Advisory Committee on Medical Research from 1911 to 1913; while from 1915 to the end of the war he was a member of the Standing Sanitary Board of the Egyptian Expeditionary Force, with the rank of colonel. He received the Kaisar-i-Hind gold medal in 1903, and the Order of the Nile in 1918, and was knighted in 1911. He had been a member of the British Medical Association for over half a century, since 1884. In 1894 he married Ethel May, daughter of the late Dr. Edward Watson of Isleham, Cambridge, and had three daughters.

SIR LEONARD ROGERS writes:

Sir David Semple belonged to an early generation of tropical diseases research workers, for after taking an honours medical degree in Belfast he entered the Army Medical Service in 1883. Early in the 'nineties he was stationed at Netley at the time Sir Almroth Wright began his brilliant researches at the Army Medical College, and Semple in 1903 took a diploma in public health and studied bacteriology, with the result that he was appointed assistant professor of pathology under Sir Almroth from 1904 to 1909 at a time when typhoid inoculation was being actively investigated, as well as work at Malta on undulant fever. Semple's work on immunology during that period naturally led to his being appointed a member of an important committee for the investigation of enteric fever in India. Typhoid at that time was causing a far higher sickness and death rate in the British Army in India than any other disease, and good water

supplies had failed materially to reduce its incidence. Robert Koch had by this time demonstrated the great importance of carriers of the disease, especially those employed as cooks or otherwise connected with food supplies. This association was verified in India, and as a result camps were organized in the hills to which all convalescent typhoid soldiers were sent and kept until proved by repeated bacteriological examinations to be completely free from infection. A great reduction in the disease in the Army soon resulted, aided by agglutination tests to discover and eliminate all carriers among the native servants employed in cook-houses, etc.

In 1900 Semple was selected for the difficult task of starting the first Pasteur Institute of India in the hill station of Kasauli, near Simla, and here he made an important advance through the use of carbolized emulsions of hydrophobia-infected rabbits' nervous tissue; for this could be sent out for use in hospitals all over the country in graduated doses. All-important time was thus saved by enabling the treatment to be carried out near the homes of the bitten people, in place of sending them many hundreds of miles to a central institute at great expense. In 1905 a central research institute for the newly formed bacteriological department (now the Medical Research Department) of the Government of India was organized at Kasauli as a separate laboratory, and Semple held the directorship until he left India under the age rules in 1913, having retired with a pension from the Royal Army Medical Corps, as it was now called, in 1905. Here he did valuable administrative work and also much to help and encourage younger research workers in an unselfish manner. Once more his services were requisitioned for the important post of Director-General of the Public Health Department in Egypt, where his bacteriological knowledge of cholera and other diseases was of value, and it was not until 1918 that he came home to a well-earned retirement. While in India he was also a member of the Scientific Advisory Committee on Medical Research, and of the Central Committee for the Study of Malaria in India, on the former of which his varied research experience was of value.

Semple was of a very quiet and somewhat reserved nature, but a sound and reliable worker and a loyal colleague. His full worth was probably only known to the few who gained his confidence and had the privilege of his friendship.

[The photograph reproduced is by Elliott and Fry, Ltd.]

DAVID FRASER-HARRIS, M.D., D.Sc.

Formerly Professor of Physiology, Dalhousie University, Nova Scotia

The death took place in London on January 3 of Dr. David Fraser-Harris, who as a physiologist and neurologist and a writer on philosophy and on certain aspects of medicine had a reputation on both sides of the Atlantic.

Fraser-Harris was born in 1867 and educated at Edinburgh Collegiate School, Edinburgh and Glasgow Universities, and University College, London. He also devoted some time to foreign study and research at Berne, Jena, and Zurich. He qualified in medicine in 1893, and four years later took his M.D. at Glasgow. For five years he served as senior assistant to the professor of physiology and Muirhead demonstrator in physiology at Glasgow, and then went on to St. Andrews, where for ten years he was acting professor of physiology. Leaving Scotland, he spent two or three years in the Midlands, as lecturer on physiology at Birmingham University and as lecturer on hygiene and school hygiene at the Birmingham and Midland Institute. While at Birmingham he delivered a noteworthy series of lectures on the essentials of physiological history, and also served as a physiologist on a commission set up to investigate artificial respiration apparatus.

In 1911 he accepted the appointment of professor of physiology at Dalhousie University, Halifax, Nova Scotia, and remained there for thirteen years. He proved an acceptable personality in academic and scientific circles in Eastern Canada, representing his university on the Medical Council of the Dominion, and occupying the chair of the Medical Society of Nova Scotia, the Halifax Medical Society, and the Nova Scotia Institute of Science. He was also captain and adjutant of the Dalhousie University Contingent, C.O.T.C. In earlier years in Scotland he had commanded the 7th (University) Company of the 1st Fife R.G.A., St. Andrews.

Returning to England in 1924 at the age of 56, Fraser-Harris had leisure to indulge his distinct gift for writing on scientific subjects in a popular way while yet doing no violence to the facts he had to present. Book after book of this kind came from his pen, all marked by a deep understanding of his subject, and at the same time by imagination and by the clear and simple language in which he excelled. His first considerable work was on *The Functional Inertia of Living Matter*, written while he was acting professor at St. Andrews. Fraser-Harris's pen led him into some curious and interesting bypaths, such, for example, as medical matters in the Apocrypha—the title of one treatise of his—the history of music in Edinburgh, and the references to biology in Shakespeare. In this last little work, published in America, he drew attention to the penetrating observation shown by Shakespeare in the realm of living things. He was also editor of the Modern Health Series.

Professor Fraser-Harris joined the British Medical Association in 1895, and was honorary secretary of the Section of Anatomy and Physiology at the Birmingham meeting in 1911. He was Armistead Lecturer at Dundee in 1895, when his subject was wave forms of speech and music, and Thomson Lecturer in Natural Science at Aberdeen in 1911, when his subject was innervation. He was a member of the Physiological Society, an original member of the Biochemical Society, and president of the Scottish Microscopical Society in 1908–9. After his return from Canada he interested himself in the People's League of Health and other activities. A man of culture and quiet charm, finding his recreation, as he phrased it, in the study of biological history, he will be missed in many circles, and the British Museum reading-room will no longer have one of its most diligent occupants.

J. EDWARD BOWSER, M.B., C.M.

We regret to record the death on December 27, 1936, of Dr. J. Edward Bowser, the oldest medical practitioner in Penrith. Though his health had been failing for some time he was at work until within a few days of the end. A native of Leeds, he studied medicine at the University of Edinburgh, and graduated in 1886. In the course of his long medical career at Penrith he held many local appointments and took an active part in the town's affairs. He had been medical officer for the L.M. and S. Railway Company in the Penrith district, and a member of the staff of the cottage hospital. During the war he had charge of the Wordsworth Street Hospital, and in more recent times was chairman of the Voluntary Aid Committee of the Cumberland and Westmorland Terri-

torial Army Association. He was twice president of the Penrith Literary and Scientific Society, which elected him an honorary member four years ago. Dr. Bowser joined the British Medical Association in 1889, and was on eight occasions elected to the Border Counties Branch Council, holding office as president in 1906–7; he had also been vice-chairman and chairman of the old North Cumberland Division, and served on the Executive Committee of the English Division for seventeen years in succession. During fifty years of active practice he had been medical attendant to many of the leading families in Mid-Cumberland and North Westmorland.

Sir HAROLD STILES writes:

By the death of J. Edward Bowser, Penrith and the counties of Cumberland and Westmorland have lost an able and much beloved physician, as well as a public-spirited and universally esteemed citizen. As a contemporary of his at Edinburgh I well remember the applause with which he was greeted by his fellow students when he gained the medal in Professor John Chiene's class of surgery. He was subsequently awarded the much coveted Vaus Dunlop scholarship in surgery and physiology (1884–7). There was no students' union in those days, but he was a prominent member of the Royal Medical Society; he took an active part also in all that concerned the social and intellectual life of the student. After taking the degrees of M.B., C.M., he went to Penrith, where he gave of his best for just half a century. An able and cultured man, with a commanding presence and courtly manner, he soon gained the confidence alike of his colleagues and patients. In his later years he became what may be termed a county consultant, as well as the helpful counsellor and confidant of the junior practitioner.

Bowser was a man who would have made his mark in whatever walk of life he chose to follow. While in him surgery may have lost a valuable exponent when he became a general practitioner, one feels that his many fine qualities and talents found a wider field of usefulness in that capacity. He spared no pains to keep himself up to date, and no sacrifice was too great where the welfare of his patients was concerned. He greatly treasured a diamond tie-pin bearing the Royal crest, a gift from King Edward VII, whom he attended when His Majesty visited the late Lord Brougham and Vaux at Brougham Hall in 1905.

In addition to holding important civil medical appointments he was the regimental medical officer to the Cumberland and Westmorland Yeomanry, retiring with the rank of surgeon major. As chairman of the Voluntary Aid Committee he did valuable work both before and during the war, and published an important monograph on "The Territorial Army and the Transport of the Sick and Wounded." He took a special interest in the treatment of fractures, and was one of the first practitioners in this country to adopt the pioneer methods introduced by Championnière of Paris. A well-read man himself, he took a delight in promoting the cultural welfare of his fellow citizens. A good organizer and gifted speaker, he made an admirable chairman at a public meeting. He filled with great acceptance the important office of president of the Border Counties Branch of the British Medical Association. Cautious and resourceful, no one could wish for a wiser counsellor or a more reliable friend; and with it all he possessed that keen sense of humour and wide knowledge of affairs which made him a delightful companion. After a visit to Bowser at Penrith one always came away stimulated by his wide outlook, and inspired by his devotion to the profession of which he was such an able and dignified representative.

SIR GRAFTON ELLIOT SMITH

Dr. A. J. E. CAVE, assistant conservator of the Museum of the Royal College of Surgeons of England, writes:

The outstanding achievements of the late Sir Grafton Elliot Smith in the field of cultural anthropology may be less familiar to his medical brethren than are his pioneer investigations into mammalian cerebral anatomy or his important contributions to the physical anthropology of primitive and of fossil man. Yet his influence in this particular field (one of increasing social and politico-economic importance) has been as profound as that of a Darwin or a Huxley in realms biological: indeed, no more may the modern ethnologist neglect a thoughtful recognition of Elliot Smith's doctrine of the diffusion of culture than the present-day biologist may dispense with some scheme at least of organic evolution.

The potent influence which Elliot Smith was later to exert had its seeds in his chance occupancy of the Cairo chair of anatomy, which brought him into close and sympathetic co-operation with the foremost Egyptian archaeologists of his day (Maspero, Junker, Reissner, Mace, Quibell, Theodore M. Davis, and others) and gave him an unrivalled acquaintance with Egyptian cultural elements of all periods of that country's history. His anatomical skill was sought increasingly in the description and recording of extensive series of human remains (cf. his contributions to the *Bulletins of the Archaeological Survey of Nubia*), and in the examination of many historic and other mummies, the volume on *The Royal Mummies*, of the Cairo Museum Catalogue, being from his pen. His numerous memoirs on mummification (continued in after years) not only gave us the first truly scientific and comprehensive analysis of this curiously distinctive practice, but also focused their author's attention sharply upon a ritual which he recognized as constituting the central nucleus of the whole of ancient Egyptian civilization. Elliot Smith intuitively perceived in the practice of mummification one of the master themes of cultural anthropology, a theme which he expanded and elaborated in later years to most fruitful purpose. It was, originally, from the mere geographical distribution, past and present, of this peculiar and difficult practice that he demonstrated (1915) *The Migrations of Early Culture*, a classic of ethnological accomplishment.

He increasingly sought, with his colleague Dr. W. J. Perry and the disciples they gathered about them, corroborative evidence of the actual spread of cultural elements and customs from one original home, and while such evidence accumulated he proclaimed, with characteristic fullness and vigour, his provocative ethnological doctrine of the "diffusion of culture." Tremendous, even bitter, was the opposition to this novel teaching, and the echoes of conflict are still about our ears. But in the main the old fallacy of a basic "psychic unity" underlying human activities and reactions was exploded, and the gist of later anthropological investigation has been a confirmation of the truth and reality of the main tenets at least of the diffusionist gospel and of Elliot Smith's penetrating conception regarding the fundamental uniformity of early civilizations. The whole face of ethnological study has been renewed, and a new and vivifying spirit infused therein.

It is to Elliot Smith's lasting credit that he, first, with an intuition transcending the merely anatomical, perceived in ancient Egypt the essential threads of primitive culure and civilization and out of them wove, on the loom of his genius, the tapestry of human history

Professor HENRY TONKS, F.R.C.S., who died on January 8 at his studio in Chelsea, was rightly looked upon as one of the most distinguished of living truants from medicine. From Clifton College he went to the Royal Sussex County Hospital at Brighton as a pupil, and thence to the London Hospital. He qualified in 1886, and became a Fellow of the Royal College of Surgeons of England in 1888 after holding house appointments and acting as temporary demonstrator of anatomy at "The London." Then followed a period of duty as senior resident medical officer at the Royal Free Hospital. By that time, however, he had made up his mind to abandon medicine for painting, and after working under Fred Brown at the Westminster School of Art he went with him as assistant at the Slade School when Brown was appointed to succeed Legros as professor of fine art at University College, London, and he in turn succeeded Brown in 1918, holding the chair until 1930. As a teacher of painting Tonks had unique gifts and he wielded very great influence. As a painter he was much admired, especially by brother painters, and last October a special exhibition of his works was given at the Tate Gallery, where seven pictures by him are permanently housed. During the war Tonks served with the Red Cross in France and elsewhere, and as one of the officially recognized artists at the front he made many paintings, his most important picture of that period being "An Underground Clearing Station, Arras," now in the Imperial War Museum collection. On his return to England he did valuable service at the Queen's Hospital for Facial Injuries, Sidcup, and more than seventy pastel drawings by him of men treated there for wounds received during the war will be found in the Army Medical Collection at the Museum of the Royal College of Surgeons of England.

Dr. W. MCKIM MARRIOTT, whose death from appendicitis occurred on November 11, 1936, was only 51 years of age. He had held the position of professor of paediatrics for twenty years in the School of Medicine at Washington University, St. Louis, U.S.A., where for a considerable number of years he had also acted as dean of this school. On July 1, 1936, he took up his new appointment of dean and director of research at the University of California School of Medicine. His contributions to paediatrics, especially in the field of infant nutrition, will ensure him a lasting reputation.

Dr. JAMES MCCONECHY, who practised at Bramwell, Leeds, for nearly half a century, has died at the age of 72. He was born in Scotland, and graduated M.B., C.M. of the University of Glasgow in 1886. After acting for a time as medical officer to the P. & O. Steam Navigation Company he settled in general practice at Bramwell, and continued in harness until a few weeks ago. He joined the British Medical Association in 1918.

Medico-Legal

MISLEADING MEDICAL TITLES

A SUCCESSFUL PROSECUTION

At Lambeth police court on January 6, before Mr. McKenna, William Mellor of East Dulwich Road, East Dulwich, was summoned at the instance of the Medical Defence Union for contraventions of the Medical Act, 1858. Mr. G. D. Roberts, counsel, instructed by Messrs. Hempsons, solicitors, appeared on behalf of the Union, and the defendant, who pleaded "Not Guilty," was represented by Mr. W. H. Chitty, solicitor.

Mr. Roberts stated that the defendant was brought up on three summonses under the Medical Act. The first was for wilfully and falsely using the description "Medical Examiner," thereby implying that he was registered under the Act; the second was for similarly using the title "Doctor of Medicine," contrary to Section 40; and the third was for using the description of "Doctor" with a like implication. The first two of these charges arose out of a form completed by Mr. Mellor for a Miss Pitman, who had applied to the Air Ministry for a private pilot licence. The requirement that such form should be in proper order was obviously very important from the Air Ministry's point of view, and a careful check was made of all signatures to such applications. At the top of the form was a notice that it must be completed by a registered medical practitioner holding British qualifications. At the foot Mr. Mellor had signed himself "William Mellor, Medical Examiner," and had added "M.A., M.D., B.Sc., Lic.Hom.Med. (India)." The third summons was in respect of the nameplate outside his surgery, which bore the title "Dr. Wm. Mellor," and in brackets after his name "India. Osteopath and Homeopath, U.S.A." Mr. Mellor's name was not on the British *Medical Register*. He claimed to hold a diploma of the Western University, Kapurthala, but the college was not recognized as issuing diplomas registrable in this country.

The defendant, in evidence, produced a number of certificates and diplomas, and declared that he held four degrees as a result of examinations in the London and Liverpool extensions of an Indian and of some American universities or colleges. He had been granted the degree of "Doctor of Osteopathy" of New Jersey College, U.S.A., and "Doctor of Medicine and Master Diagnostician" of the American Academy of Medicine and Surgery. He had never held himself out to be on the British *Medical Register*, nor attempted to practise as such. It was submitted on his behalf that there was here no case of wilfully and falsely using a title or description.

On the first summons, that of wrongly using the title "Medical Examiner," Mr. Mellor was fined ten pounds with twenty guineas costs. On the second summons, which related to the same occasion, no fine was imposed, and the third, based on the nameplate, was dismissed.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Dr. John Alfred Ryle, Regius Professor of Physic, has been elected to a professorial fellowship at Gonville and Caius College.

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

M.D.—*Branch I (Medicine):* J. A. Brocklebank, A. M. R. Cann, E. A. Danino, C. J. Gavey, N. M. Green, R. R. Henderson, A. L. P. Jeffery, M.S., E. Jones, E. I. Jones, F. A. Jones, A. L. Light, M.S., G. A. M. Lintott, Mary F. Lockett, B. McArdle, D. C. Reavell, A. M. Stewart-Wallace, J. B. L. Tombleson. *Branch II (Pathology):* G. J. Cunningham, A. H. T. Robb-Smith (University Medal). *Branch III (Psychological Medicine):* A. C. Dalzell (University Medal). *Branch IV (Midwifery and Diseases of Women):* Agnes V. Kelynack, L. W. Lauste, G. G. Macdonald, Marjorie E. Roberts, J. W. Schabort, Violet H. Whapham. *Branch V (Hygiene):* K. Biden-Steele.

M.S.—*Branch I (Surgery):* J. Howkins, J. B. G. Muir (University medal), E. J. Smith.

Lectures at University College

Professor J. C. Drummond will deliver a course of six public lectures on "Problems of Nutrition" at University College, Gower Street, W.C., on Tuesdays, at 5 p.m., from January 19 to February 23, and a course of six public lectures on "Chemical Structure and Pharmacological Action" will be given by Dr. H. R. Ing on Mondays, at 5 p.m., from January 25 to March 1. Admission to all the lectures without fee or ticket.

Recognition of Teachers

The following have been recognized as teachers of the University in the subjects indicated in parentheses:

King's College: Dr. H. A. Dunlop (Pharmacology).

St. Bartholomew's Hospital Medical College: Mr. J. P. Hosford (Surgery); Dr. James Maxwell and Dr. A. W. Spence (Medicine).

St. George's Hospital Medical School: Dr. J. D. Benjafield (Pathology and Bacteriology); Mr. R. Marnham (Surgery); Dr. T. F. McN. Scott (Medicine).

London (Royal Free Hospital) School of Medicine for Women: Mrs. Joan Taylor, M.B., D.P.H. (Bacteriology).

London School of Dental Surgery: Mr. B. W. Fickling, M.R.C.S., and Mr. D. G. Walker, M.B. (Dental Surgery).

National Institute for Medical Research: Dr. Percival Hartley (Hygiene and Public Health); Sir Patrick Laidlaw (Pathology and Bacteriology).

Lectures

A course of three lectures on "Some Disorders of the Peripheral Circulation" will be given by Professor E. D. Telford at St. Mary's Hospital Medical School on Tuesdays, February 9, 16, and 23, at 5.30 p.m. Professor Charles Pannett will take the chair at the first lecture.

UNIVERSITY OF ABERDEEN

The King, on the recommendation of the Secretary of State for Scotland, has approved the appointment of Professor Lancelot Hogben, D.Sc., F.R.S., to the Regius Chair of Natural History, in place of Professor James Ritchie, resigned.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow, held on January 4, with the president, Professor Archibald Young, in the chair, the following were admitted Fellows of the Faculty: J. S. Cramer, M.B., Ch.B., R. A. Davar, M.B., B.S., A. Hutchison, M.B., Ch.B., Agnes T. Kennie, M.B., Ch.B., S. M. Laird, M.B., Ch.B., P. J. Molloy, M.D., B. B. Mukerjee, M.B., C. C. Saha, M.B., M.Sc., T. S. Subramaniam, M.B., B.S.

Medical News

According to information received from the Ministry of Health there were 768 deaths from influenza in 122 great towns in the week ended January 9 compared with 325 for the previous week. The number of notifications of primary and influenzal pneumonia throughout the country showed a corresponding increase from 1,513 to 2,321. Of the 768 deaths, 558 occurred in the South-Eastern area (including London) 98 in the Midlands, 87 in the North, 18 in Wales, 5 in the South-West, and 2 in the Eastern Counties.

The Hunterian Lecture will be delivered before the Hunterian Society of London at the Mansion House on Monday, January 18, at 9 p.m., by Dr. J. Schoemaker of The Hague, on "The Surgery of Gastro-duodenal Inflammation." The annual dinner of the society will be held at the May Fair Hotel on February 17.

The annual meeting of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, on Wednesday, January 20, at 5.30 p.m., when Dr. R. S. Clay will deliver his presidential address on "The Mechanical Development of the Microscope."

The next meeting of the Réunions de Morphologie Medico-Chirurgicale will be held at 9 p.m. at 7, Rue de la Chaise, Paris, on Wednesday, January 20. The topics to be discussed include the morphology of nerve roots and difficulties attending their avulsion; sexual inversion and sex determination; and the problems of facial reconstructive surgery. This society, which meets monthly, associates specialists in orthopaedics, physiotherapy, plastic surgery, endocrinology, in symposia on questions relating to the prevention and treatment of deformities. Further information may be had from Dr. C. Claoue, 39, Rue Scheffer, Paris.

The campaign of the Road Accidents Emergency Council will be opened with a conference in the Livingstone Hall, Westminster, on Saturday, January 23, attended by delegates from affiliated and other organizations. A resolution will be submitted in the following terms: "This conference of delegates, representative of the religious, educational, social, and industrial life of the country, gravely concerned at the appalling toll of killed and injured on the roads, which shows no sign of abatement, calls upon the Government to take immediate action to (*a*) establish special courts for the trial of road traffic offences; (*b*) adapt the existing highway system to ensure a larger measure of safety to all users; (*c*) control effectively the speed of motor vehicles on public highways; (*d*) ensure that adequate compensation is paid in respect of all victims of road accidents in cases where the victims are not solely responsible for their death or injury." Inquiries should be addressed to the secretary, Road Accidents' Delegate Conference, 37, Norfolk Street, W.C.2.

A conference to discuss the administration of the Milk (Special Designations) Order, 1936, with respect to accredited milk will be held under the auspices of the Royal Sanitary Institute at the Central Hall, Westminster, S.W., on Thursday, January 28, at 2 p.m., when Mr. Thomas Baxter, chairman of the Milk Marketing Board, will preside, and the discussion will be opened by Dr. W. G. Savage. Invitations have been sent to local authorities in England and Wales to appoint representatives to this meeting.

The seventh annual report of the National Radium Trust and Radium Commission, 1935–6, including a statistical report, is published to-day as a Command Paper (Cmd. 5342), price 1s. 6d.

The *London University Gazette* of January 6 announces that the Senate of the University invites applications for the chair of pathology tenable at the British Post-Graduate Medical School, Ducane Road, W. The salary is £2,000 per annum, and the latest date for applications is April 16.

As already announced, Hospital Week in London and Greater London is timed for May 2 to 8, immediately before the Coronation. Over eighty hospitals are uniting in one great concentrated attack instead of flag days scattered throughout the year. The central committee in charge of the arrangements is in search of an emblem which can become to Hospitals Week what the Red Cross and the Flanders poppy already are in public estimation. Suggestions should be addressed to the hon. secretary, Hospitals Week, 36, Kingsway, W.C.2, but no prizes are offered.

The issue of *Revue Médicale Française* for December is devoted to urology, that of *Le Sud Médical et Chirurgical* for December to industrial accidents and social medicine, and that of *Paris Médical* for January 2 to tuberculosis.

The Hungarian Society of Public Health celebrated the fiftieth anniversary of its foundation on December 12, 1936.

Professor Martel has been elected president of the Académie de Médecine for 1937 in succession to Professor Hartmann, and Professor Besançon succeeds him as vice-president.

Dr. Baumgartner has been elected president of the Académie de Chirurgie for 1937, and Dr. Edmond Sergent, director of the Pasteur Institute at Algiers, has been elected non-resident member of the Académie des Sciences in place of the late Dr. Charles Nicolle.

The Laveran gold medal of the Société de Pathologie Exotique of Paris has been conferred on Dr. Andrew W. Sellards, associate professor of tropical medicine, Harvard University Medical School, in recognition of his preparation of an effective vaccine against yellow fever.

Last August the population of Berlin increased by about 5,000 births up to 4,226,040. The increase continued in September, when 5,276 living children were born and 4,003 persons died.

The sale of contraceptive appliances by automatic machines or advertisement as to where they can be obtained has been forbidden in Vienna on pain of a fine of 200 schillings or a fortnight's imprisonment.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are

EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone 62550 Dublin).

QUERIES AND ANSWERS

Treatment of Lumbago

"S. L. A." writes: Have any readers experience of solurol and urodonal in the treatment of lumbago? Has the urine to be acid or alkaline to get best effects? Is there any risk (as with atophan and its allied drugs) in prolonged use? What dose is recommended for an adult, and how often daily?

Income Tax

Allowance to Relative

"JUSTICE" makes an allowance of £14 a month to a relative who has no other income, and asks whether it would be legal to allot this money by deed and so avoid paying income tax thereon.

*** It would be quite legal, but would be ineffective for income tax purposes unless the disposition of the income was for a minimum period of seven years, or for the joint lives of "Justice" and the relative, whichever period be the less. (It is assumed that the relative is not a son or daughter of our correspondent.) Once the payment has become legally compulsory "Justice" can deduct tax at standard rate when making the payments, and the relative can then reclaim from the Inland Revenue Department nearly the whole of the tax so deducted. As matters stand "Justice" is entitled only to the dependant relative allowance, subject to the condition that the dependence is due to old age or infirmity.

Private Use of Cars

"S. S." asks whether it is usual to charge income tax on "private use" of cars when the private use is very slight.

*** We believe the answer to be in the affirmative. Most inspectors of taxes make a point of inquiring about private use where the cost of maintenance, etc., is claimed as "wholly and exclusively" incurred in earning profits. To the extent that the expenses do not fall within that category they are not allowable, and though there may be some cases in which private use is so small as to be ignored, it is certainly very common for, say, 5 per cent., or even more, to be excluded from the total cost when calculating taxable profit.

LETTERS, NOTES, ETC.

Prophylactic Against Influenza

Dr. ALEXANDER FRANCIS (London, W.1) writes: At a time like this, when influenza is so rife, it is sad that Dr. Carl Spengler's advice is not properly appreciated. He stated that if anyone would take three drops of the English tincture of iodine in two tablespoonfuls of milk after breakfast daily for three weeks he would remain immune from influenza for months. I have tested this remedy for many years in private practice and in schools with astounding results. It has the great disadvantage of being too simple. It is not impressive, as are vaccines, gargles, douches, etc., but on the other hand it has the advantage of being effective. The iodine must be taken in milk, because in the form of iodide of casein it is not in any way irritating. Some few people who are subject to iodism cannot take iodine in any form.

Psychotherapy of Delinquency

With reference to the weekly seminars for probation officers and social workers arranged by the Institute for the Scientific Treatment of Delinquency, announced in the *Journal* of October 31, 1936 (p. 901), we are informed that Dr. Denis Carroll will speak on "Psychiatry and Psychotherapy of Delinquency" at the West End Hospital for Nervous Diseases, Welbeck Street, W., on Thursdays, January 21 and 28, at 6.45 p.m. Admission 1s. 6d.

C.S.M.M.G. Directory

The Chartered Society of Massage and Medical Gymnastics has issued a *Directory of Members*, which is supplied free on demand to medical practitioners, who by this means can easily find the names of masseurs and masseuses practising locally. Since the members of the C.S.M.M.G. are precluded from undertaking any case except under the direction of a registered medical practitioner, from advertising in other than recognized medical and nursing papers, from selling goods to patients in a professional capacity, and from accepting secret commissions on the sale of goods, they have a special claim on medical practitioners whose patients are in need of physical therapy in its various forms. Special designations are attached to those who hold additional qualifications in medical electricity, light- and electro-therapy, and hydrotherapy, as well as to those who are teachers in such subjects. Members with additional qualifications, such as associates of the Royal Sanitary Institute, members of the Society of Radiographers, and registered mental or fever nurses, are correspondingly distinguished. The *Directory* is compiled alphabetically in geographical sections, including England, London, Scotland, Wales, Ireland, and in foreign countries; an alphabetical list of practising members is also given after the geographical section. Applications should be sent to the secretary, C.S.M.M.G., Tavistock House (North), Tavistock Square, London, W.C.1.

A Medical Veteran

Dr. Cuthbert Robert Kendal of Hexham, Northumberland, celebrated his ninety-fifth birthday on January 1st. He began practice in Wark in 1863 immediately after qualifying, and went to Hexham in 1870.

Merck Products

Messrs. E. Merck, Darmstadt, manufacturers of chemicals and medicinal specialties, announce that since January 1, 1937, the selling rights for their preparations in the United Kingdom and Irish Free State have been in the hands of Messrs. Savory and Moore, Ltd., of 61, Welbeck Street, London, W.1. The publicity department of E. Merck, which was established in this country for the convenience of medical practitioners wishing information and samples of the Merck products, has moved to 60, Welbeck Street.

Treatment of Streptococcal Infections

It may interest readers to know that para-aminobenzene sulphonamide, referred to in the leading article entitled "Therapia Sterilisans Magna" in the *Journal* of January 9 (p. 79), is obtainable from a number of firms in this country.

Correction

Our report of Dr. H. W. Eddison's paper on "Anxiety" (January 9, p. 92) went astray in the second column, line 19. The passage should read: "In the war many, in spite of their anxiety, stuck to their posts and masked their anxiety behind their deeds, working off their emotion coincidently. *On the other hand, the men who were stolidly unconcerned (to all appearances)* afterwards displayed tremors . . ." (correction printed in italics).